

Anchor Bay Watershed Management Plan

Volume II - Appendices



December 1, 2003

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Appendix A:

State of the Watershed Support Data

Figure 1-2: Anchor Bay Wetland Areas

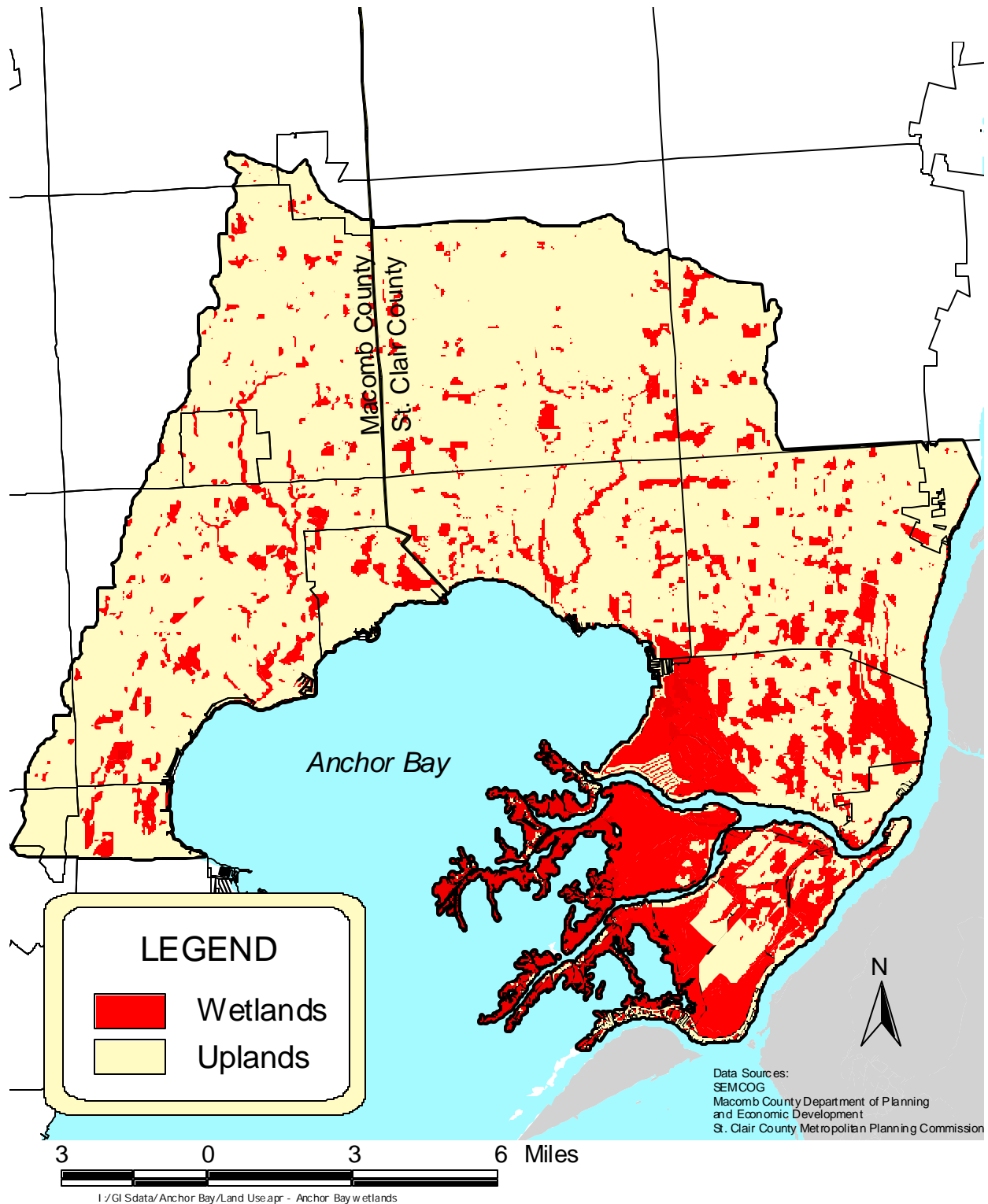


Figure 1-5: Anchor Bay Monitoring Sites

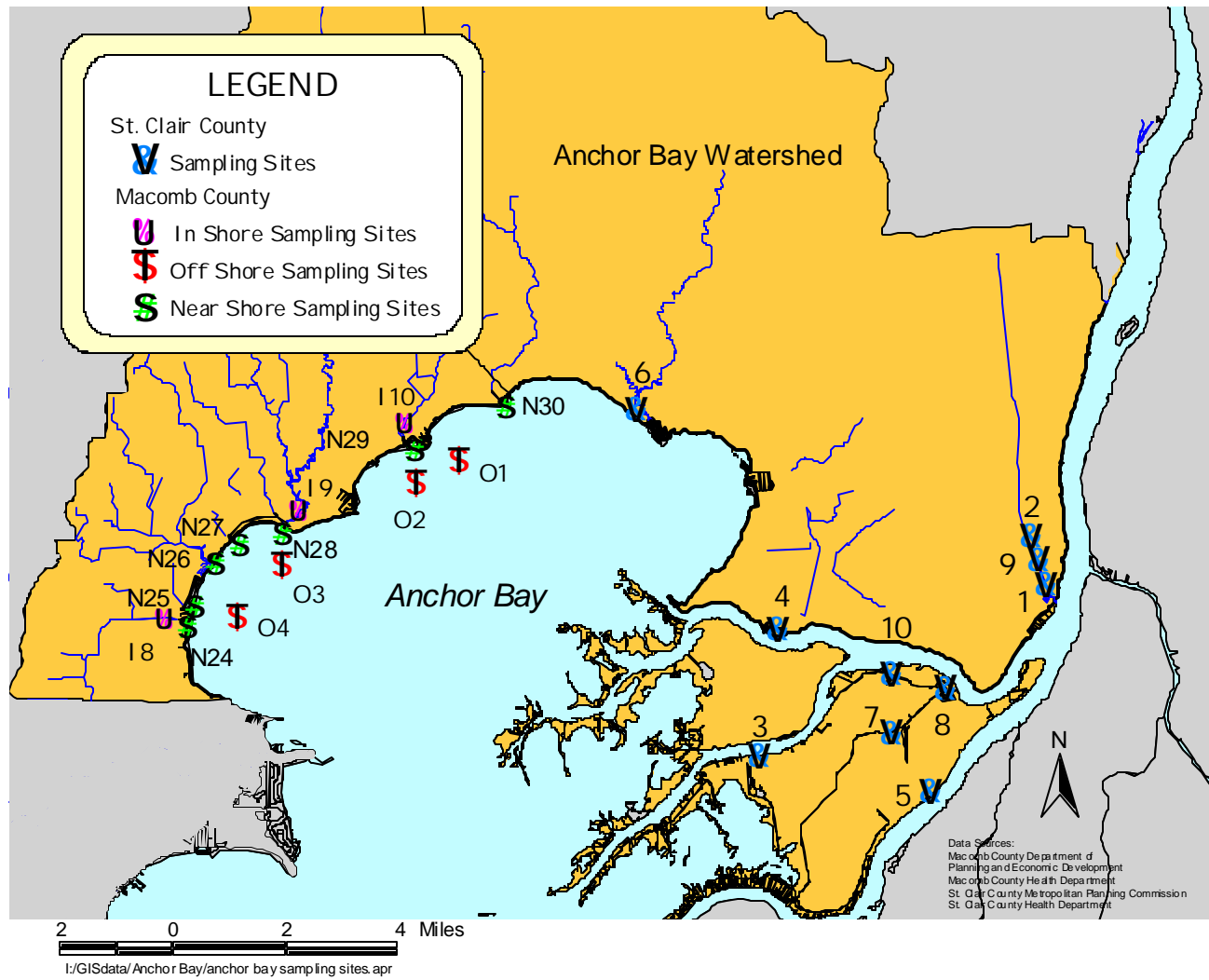
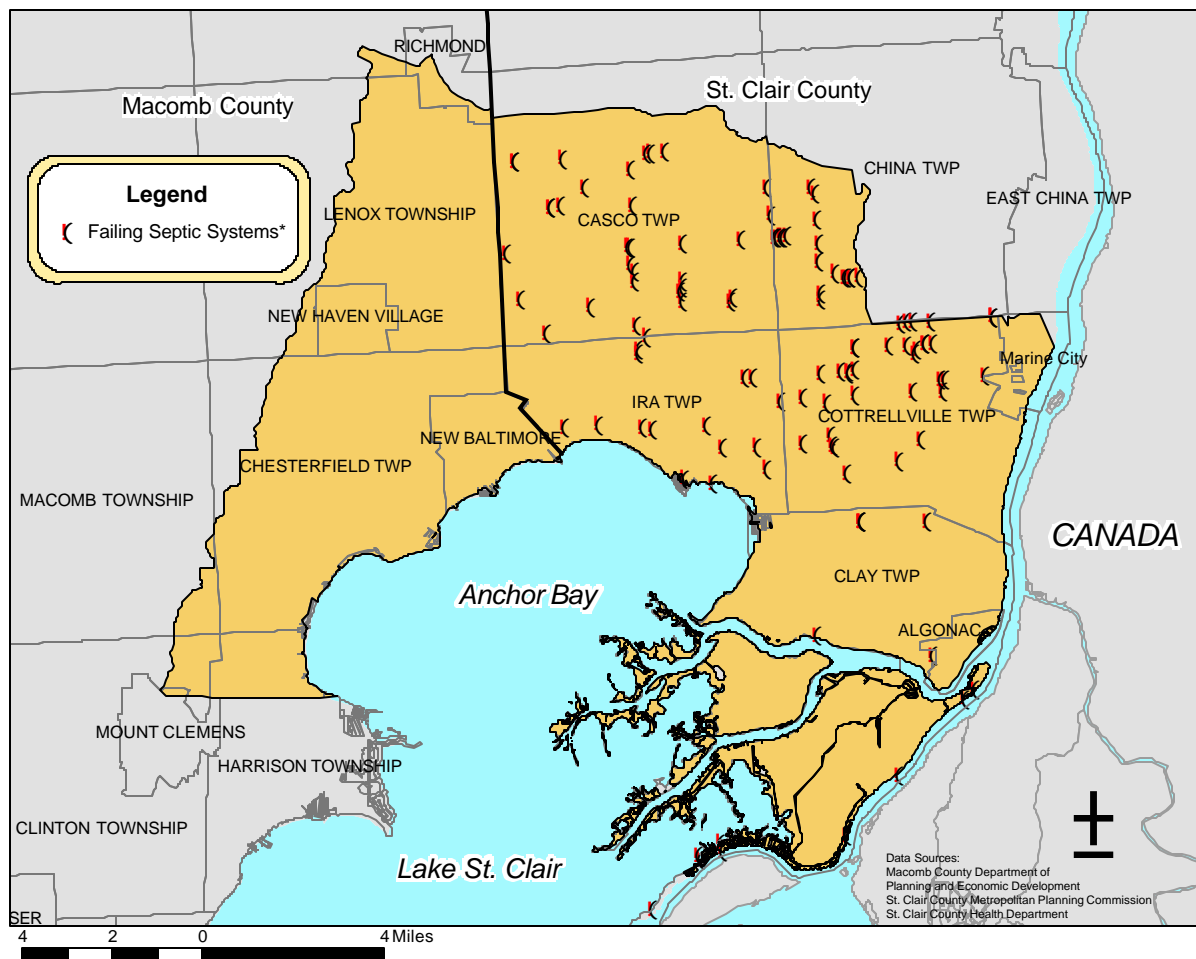


Figure 1-6: Failing Septic Systems within St. Clair County



I:/Gisdata/Anchor Bay/SCCDC Map - AB failing septs

* As identified by SCCHD Illicit Discharge Elimination Program (IDEP). MCHD IDEP in progress, therefore data is not yet available.

Figure 1-7: Locations Exceeding Level of Concern for DO

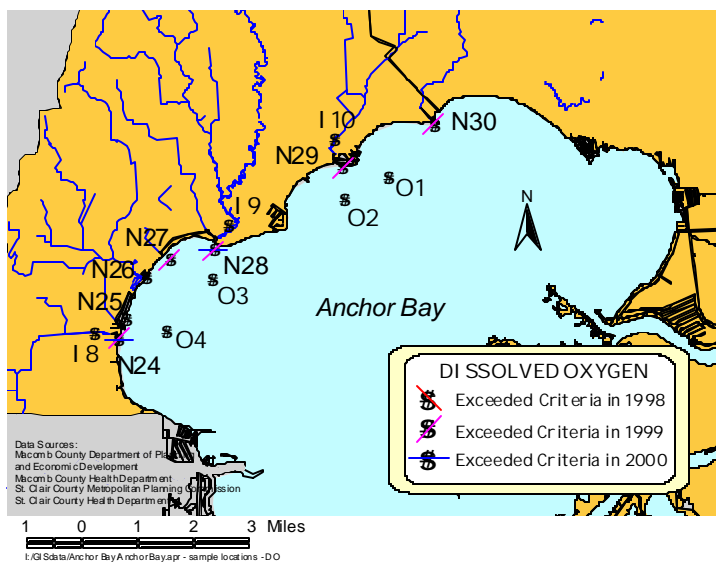


Table 1-1: Anchor Bay Watershed Permitted Dischargers

Facility Name	Permit Number	Type of Facility	Type of Wastewater
Algonac Water Filtration Plant (WFP)	MI0048674	Municipal	Water filtration backwash
Marine City WFP	MIG40183	Municipal	Water filtration backwash
Marine City Wastewater Treatment Plant (WWTP)	MI0020893	Municipal	Treated Domestic Wastewater
Old Club WWTP	MIG570210	Private	Treated Domestic Wastewater
St.Clair County – Algonac WWTP	MI0020389	Municipal	Treated Domestic Wastewater
Americana Estates of Casco	MI0027073	Private	Treated Domestic Wastewater
Anchor Bay Schools – Casco	MIG580328	Private	Treated Domestic Wastewater
Belle Maer Harbor	MI0056316	Private	
MDOT I-94 WB/SB Rest Area	MIG580027	State	Treated Domestic Wastewater
MDOT I-94 EB/NB Rest Area	MIG580026	State	Treated Domestic Wastewater
Millstone Pond Mobil Home Park (MHP)	MI0055816	Private	Treated Domestic Wastewater
New Baltimore WWTP	MI0023680	Municipal	Treated Domestic Wastewater
New Haven Foundry	MI0038032	Private	Treated cooling water and storm water runoff
Northampton Community MHP	MI0056472	Private	Treated Domestic Wastewater
Pankiewicz Farm	MI0043770	Private	Treated fruit wash water
U.S. Army Tank Command – Selfridge	MI0055948	Federal	Treated storm water runoff

Table 1-2: Water Quality Parameters and Years Sampled

Parameters	Years Sampled
Aluminum	1998, 1999, 2000
Nitrate	1998, 1999, 2000
Nitrite	1998
Biochemical Oxygen Demand (BOD)	1998, 1999, 2000
Chloride	1998, 1999, 2000
Chemical Oxygen Demand (COD)	1998
Total Organic Carbon (TOC)	1998, 1999, 2000
Total Suspended Solids (TSS)	1998, 1999
ortho-Phosphorus	1998, 1999, 2000
Ammonia-N	1998, 1999, 2000
Total Phosphorus	1998, 1999, 2000
Kjeldahl Nitrogen (TKN)	1998, 1999, 2000
Chlorophyll A	1998
Dissolved Oxygen (DO)	1998, 1999, 2000
Chlorophyll-A	1998

Table 1-3: Macomb County Health Department Surface Water Sampling Sites

Began Sampling	Sites Sampled
1995	Site 46-Crapau Creek at Main St. Site 45-Salt River at Lake St. Clair Site 47-Salt River at Washington Rd.
1998	Site 37-Salt River at 29 Mile Rd. & Gratiot
1999	Site 46.3-Crapau Creek at County Line Rd. south of 25 Mile Rd. Site 46.7-Crapau Creek at Ashley St.
2000	Site 46.9-Crapau Creek upstream of Site 46 Site 46.2-Crapau Creek at County Line Rd. south of I-94
2001	Marsac Drain at Lake St. Clair

Table 1-4: Macomb County Health Department *E. coli* Analysis (MPN/100 ml)

Site 37 Salt River at 29 Mile Rd.				Site 39 Marsac Drain at 29 Ruedisale Park		
Year	Yearly High	Yearly Low	Geo. Mean	Yearly High	Yearly Low	Geo. Mean
1995	*	*	*	*	*	*
1996	*	*	*	*	*	*
1997	*	*	*	*	*	*
1998	9,000	100	494	*	*	*
1999	12,033	47	500	*	*	*
2000	19,863	31	575	*	*	*
2001	4,884	10	242	9,804	1	60
2002	32,820	10	289	43,520	1	59

Site 45 Salt River at Jefferson Ave.				Site 46 Crapau Creek at Main St.		
Year	Yearly High	Yearly Low	Geo. Mean	Yearly High	Yearly Low	Geo. Mean
1995	1,800	1	65	4,000	20	260
1996	11,500	10	135	6,000	50	338
1997	5,794	1	75	4,800	20	198
1998	500	20	93	37,000	20	398
1999	9,208	1	32	24,192	5	309
2000	5,794	1	75	12,997	20	470
2001	3,076	1	49	6,240	20	269
2002	3,076	1	44	24,192	1	191

Note: *Not Sampled

Table 1-4: Macomb County Health Department *E. coli* Analysis (MPN/100 ml) (continued)

Site 46.2 County Line Ditch at Hobarth				Site 46.3 Crapau Creek at County Line Rd.		
Year	Yearly High	Yearly Low	Geo. Mean	Yearly High	Yearly Low	Geo. Mean
1995	*	*	*	*	*	*
1996	*	*	*	*	*	*
1997	*	*	*	*	*	*
1998	*	*	*	*	*	*
1999	*	*	*	7,701	4	174
2000	17,329	134	1,013	14,136	10	364
2001	7,701	10	248	5,172	10	119
2002	48,840	1	238	8,164	1	146

Site 46.6 Vanderbenne Drain at Fox Pointe				Site 46.7 Crapau Creek at Ashley		
Year	Yearly High	Yearly Low	Geo. Mean	Yearly High	Yearly Low	Geo. Mean
1995	*	*	*	*	*	*
1996	*	*	*	*	*	*
1997	*	*	*	*	*	*
1998	*	*	*	*	*	*
1999	*	*	*	9,208	22	835
2000	24,192	30	726	19,863	10	709
2001	14,136	1	229	19,863	10	321
2002	17,329	1	202	24,192	10	317

Site 46.9 Crapau Creek at Green St.				Site 47 Salt River at Washington St.		
Year	Yearly High	Yearly Low	Geo. Mean	Yearly High	Yearly Low	Geo. Mean
1995	*	*	*	8,000	10	469
1996	*	*	*	13,600	10	811
1997	*	*	*	2,700	20	328
1998	*	*	*	6,600	100	634
1999	*	*	*	15,531	100	598
2000	12,033	1	250	24,192	10	387
2001	3,873	10	209	6,131	10	236
2002	19,863	1	113	10,462	20	264

Note: *Not Sampled

Table 1-5: Sediment *E. coli* Readings (CFU/g)

Site	5/19/98	7/28/98	9/22/98	5/27/99	7/15/99	9/9/99	5/11/00	7/6/00	8/31/00
Irwin Drain (N24)	1400	7200	400	3	0	2	2	0	5
Salt River (N28)	5600	6800	1100	11	0	3	0	24	260
Crapau Creek (N29)	5100	1200	800	*	*	*	*	*	*
Salt River (O3)	*	*	*	0	92	0	74	3	3
Irwin Drain (O4)	*	*	*	0	1	0	7	0	2

Note: *Not Sampled

Table 1-6: Summary of Water Quality Analysis Results

Parameter	Levels of Concern ¹	Mean Value	Summary
		Highest Reported Value	
Aluminum		0.33 mg/L	-Summer levels were highest for near shore, and fall for off shore. -No significant difference for near and off shore values. -No significant difference between wet and dry samples. -Higher than average values appeared at Irwin Drain (98, 99, 00), Salt River (99, 00), River Voss (98) and Marsac Drain (98). -Three year average (near shore): Salt River, 0.596 mg/L; Irwin Drain, 0.559 mg/L; Crapau Creek, 0.297 mg/L.
		1.1 mg/L	
Ammonia-N	>0.2 mg/L	0.04 mg/L	-No apparent seasonal trends -Near shore values were significantly higher than off shore values -Irwin Drain exceeded threshold (0.32 mg/L) in fall of 1999 and has an overall average (three years) of 0.113 mg/L. -Dykeman drain had a value of 0.2 mg/L in fall 1999. -Salt River had the second highest overall average with 0.074 mg/L.
		0.32 mg/L	
Biochemical Oxygen Demand (BOD)	>4 mg/L	0.32 mg/L	-Averaging all data BOD values were highest in the summer for near and off shore locations. -Near shore values were higher than offshore values -All samples were below threshold value/RDL. -Salt River had a reading of 3.5 mg/L (near shore) in summer 2000, 2.2 mg/L (near shore) in spring 1998 and 3 readings in 1999 and 2000 that averaged around 2.3 mg/L (off shore).
		3.5 mg/L	
Chemical Oxygen Demand (COD)		1.27 mg/L	-COD was only sampled in 1998 -Schmidt Drain, River Voss and Dykeman Drain were below RDL for COD (near shore). -All other near shore locations had at least one reportable level. -All off shore samples were below RDL.
		17 mg/L	
Chloride		20.6 mg/L	-Near shore samples were higher than off shore -Dry and wet weather samples were not significantly different. -High concentrations at Irwin Drain and Salt River
		92 mg/L	
Chlorophyll-a	>14µg/L – EPA level	0mg/L	-Only sampled in 1998 -All results were below RDL. ²
		0 mg/L	
Dissolved Oxygen (DO)	<5 mg/L	Range	-DO values were the lowest in the summer. -Near shore values were lower than off shore values. -Locations with highest averages: Irwin Drain, Salt River and Dykeman Drain.
		(2.55 – 13.5 mg/L)	

Notes: *Threshold limits/ sample information and some conclusions from Macomb County Health Department.

*Trends are compiled from the Macomb County - Lake St. Clair Water Quality Assessment (1998, 1999, 2000)

1. Levels of concern from Macomb County Health Department, Michigan water quality standards and personal communication with Joe Rathbun and Mark Oemke from MDEQ.

2. RDL = Reportable Detection Limit

Table 1-6: Summary of Water Quality Analysis Results (continued)

Parameter	Levels of Concern ¹	Mean Value	Summary
		Highest Reported Value	
Nitrate	>0.3 mg/L	0.26 mg/L	-Spring levels were highest for both near and off shore locations. -No significant difference for near and off shore values. -Nitrate levels exceeded the pollution threshold for almost every spring sample at every location (near and off shore). -Crapau Creek exceeded 7 out of 9 near shore samples with a high value of 1.6 mg/L. -Salt River exceeded all three samples in 2000 with a high of 0.89 mg/L.
		1.6 mg/L	
Nitrite		0 mg/L	-Levels were below detection limits for all samples.
		0 mg/L	
Ortho-Phosphorus (ortho-P)		0.02 mg/L	-Averaging all data, near shore values were highest in the springtime and off shore values were highest in the fall by a small margin. -Near shore values were higher than off shore values. -No significant difference between wet and dry weather samples. -High three year averages (near shore): Salt River, 0.0423 mg/L; Irwin Drain, 0.034 mg/L; Dykeman Drain 0.0234
		0.11 mg/L	
Total Kjeldahl Nitrogen (TKN)		1.0 mg/L	-No significant seasonal trends. -Off shore TKN values were higher than near shore values. -High three-year averages (off shore): Crapau Creek, 2.2 mg/L; Irwin Drain, 1.91 mg/L. -High three year averages (near shore): Irwin Drain, 0.59 mg/L; Salt River, 0.55 mg/L; Dykeman Drain, 0.52 mg/L.
		8 mg/L	
Total Organic Carbon (TOC)	>10 mg/L	3.9 mg/L	-No significant seasonal trends. -Near shore samples were higher than off shore. -Irwin Drain had the highest 3 year average of 5.81 mg/L, Salt River's average was 5.5 mg/L and Marsac Creek's was 3.84 mg/L.
		9.2 mg/L	
Total Phosphorus (Total P)	>.05 mg/L	0.045 mg/L	-Near shore values were highest in the spring and no significant seasonal trend was found in the offshore values. -Near shore values were significantly higher than off shore values -High three year averages (near shore): Salt River, 0.0978 mg/L; Irwin Drain, 0.0864 mg/L.; Dykeman Drain 0.056 mg/L
		0.17 mg/L	
Total Suspended Solids (TSS)	>80 mg/L – RPO level	17.6 mg/L	-TSS was sampled in 1998 and 1999. -TSS levels were highest in the spring. -Near shore values were higher than off shore values. -Wet weather samples were higher than dry weather samples. -Two-year averages include (near shore): Dykeman Drain, 43.5 mg/L; Irwin Drain, 30.5 mg/L; Marsac Creek, 26.5 mg/L. -Many locations were over the mean value
		170 mg/L	

Notes: *Threshold limits/ sample information and some conclusions from Macomb County Health Department.

*Trends are compiled from the Macomb County - Lake St. Clair Water Quality Assessment (1998, 1999, 2000)

1. Levels of concern from Macomb County Health Department, Michigan water quality standards and personal communication with Joe Rathbun and Mark Oemke from MDEQ.

2. RDL = Reportable Detection Limit

Table 1-7: Sediment Samples Sites

Site ID	Location	Years Sampled
N24	Irwin Drain	1998, 1999, 2000
N27	Dykeman Drain	1999, 2000
N28	Salt River	1998, 1999, 2000
N29	Crapau Creek	1998, 1999, 2000
N30	Marsac Creek	1999, 2000
O3	Salt River	1999, 2000
O4	Irwin Drain	1999, 2000

Table 1-8: Conventional Parameters

Parameters	Years Sampled
Total Phosphorus (TP)	1998, 1999, 2000
Total Kjeldahl Nitrogen (TKN)	1998, 1999, 2000
Chemical Oxygen Demand (COD)	1998, 1999, 2000
Ammonia	1998, 1999, 2000
Metals	1998, 1999, 2000

Table 1-9: Average Sediment Concentrations

Site ID	TP	TKN	COD	Ammonia
Irwin Drain (N24)	469	1779	78000	41
Dykeman Drain (N27)	340	507	16000	6
Salt River (N28)	157	504	13589	7
Crapau Creek (N29)	94	313	8667	7
Marsac Creek (N30)	175	587	13000	15
Salt River (O3)	200	290	9450	6
Irwin Drain (O4)	280	565	22000	2

Table 1-10: Sediment Metal Pollution Classification Guidelines

	OMOE Low Effect Level (mg/kg)	OMOE Severe Effect Level (mg/kg)	EPA Threshold Effects Concentration (mg/kg)	EPA Probable Effects Concentration (mg/kg)
Arsenic	6.0	33.0	9.79	33
Cadmium	0.6	10.0	0.99	4.98
Chromium	26.0	110.0	43.4	111
Copper	16.0	110.0	31.6	149
Lead	31.0	250.0	35.8	128
Mercury	0.2	2.0	0.18	1.06
Nickel	na	na	22.7	48.6
Zinc	120	820.0	121	459

Note: OMOE = Ontario Ministry of Environment, EPA = United States Environmental Protection Agency
Values not available (na) for the following metals: Mn, Ba, Fe, Se and Ag

Table 1-11: Anchor Bay Designated and Beneficial Uses

*Designated Use (D) and Beneficial Uses (B)	Impairment Status		Cause k = known s = suspected
	Anchor Bay	Watershed Area	
1. Agriculture (D),(B)	Not Impaired	Not Impaired	
2. Industrial Water Supply (D),(B)	Not Impaired	Not Impaired	
3. Public Water Supply at the point of intake (D),(B)	Not Impaired	Not Impaired	
4. Navigation (D)	Not Impaired	Not Impaired	
5. Warmwater/Coldwater Fishery (D)	Not Impaired	Impaired	Loss of habitat (k)
6. Other indigenous aquatic life and wildlife (D),(B)	Impaired	Impaired	Loss of habitat (k)
7. Partial Body Contact Recreation (D),(B)	Impaired	Impaired	Elevated <i>E.coli</i> Concentrations (k)
8. Total Body Contact Recreation between May 1 and October 31 (D),(B)	Impaired	Impaired	Elevated <i>E.coli</i> concentrations (k)
9. Degradation of phytoplankton and zooplankton populations (B)	Unknown	Unknown	
10. Degradation of Aesthetics (B)	Impaired	Impaired	Excessive aquatic plant growth in Anchor Bay (k) and excessive nutrients and sediment in watershed (s)
11. Eutrophication or undesirable algae (B)	Impaired	Impaired	Excessive aquatic plant growth in Anchor Bay (k) and excessive nutrients in watershed (s)
12. Restrictions on dredging activities (B)	Not Impaired	Not Impaired	
13. Degradation of benthos (B)	Impaired	Impaired	Loss of habitat in Anchor Bay (k) and tributaries (s)
14. Bird or animal deformities, reproductive problems (B)	Unknown	Unknown	
15. Fish tumors or other deformities (B)	Unknown	Unknown	
16. Degradation of fish and wildlife populations (B)	Unknown	Unknown	
17. Tainting of fish or wildlife flavor (B)	Not impaired	Not Impaired	

Note: *As defined by the MDEQ

Appendix B:

Inventory of Typical Tributary Drains in the St. Clair County Portion of the Anchor Bay Watershed

Inventory of Typical Tributary Drains in the St. Clair County Portion of the Anchor Bay Watershed REV. 01/15/03

Report by Daniel Rhein, Drain Inspector, for the Office of the St. Clair County Drain Commissioner

Methodology:

Dan Rhein wrote this report based on county drains that he walked in 2002. He took photographs and made field notes during and after the inspections. Some of the inspections were done as maintenance inspections for the Drain Commissioner's Office. Others were done as part of the Drain Office's Illicit Discharge Elimination Program. He also based the report on his prior knowledge and familiarity with the Anchor Bay Watershed and other similar areas in St. Clair County.

Listed below are the portions of drains that he walked, with the portion of the drain indicated by a survey Section number of a township or Private Claim number (P.C.):

Arnold Drain – Cottrellville Township, Section #3, #4
Bay Drain – Ira Township, Section #24
Benoit Drain and Branch No. 1 – Ira Twp. Section #6, #7; Casco Twp. #31
Beaubien Creek Drain - Cottrellville Twp. Section #5, #7, #8, #18, #19
Cartwright Drain – Clay Twp, Section #3 and City of Algonac
Casco Extension Drain – Casco Twp, Section #8
Clippert Drain – Cottrellville Twp., P.C. #186
Cottrell & Extension Drain – Cottrellville Twp, Section #12 & Marine City
Crapau Creek Drain – Ira Twp, Section #7, #8
Crowley Drain – Marine City
Dana Drain – Clay Twp, Section #4, #9, #33 and City of Algonac
Geyman Drain – Cottrellville Twp, P.C. #598
Grandchamp Drain – Cottrellville Twp, Section #7
Lester-Bammel Drain – Cottrellville Twp, Section #2, #11, P.C. # 598, P.C. #187
Marsac Creek Drain – Ira Twp, Section #7, #8, Casco Twp, Section #3
McKinley Drain - Cottrellville Twp, Section #8
Meldrum Drain – Casco Twp, Section #17
Parquett Drain – Marine City
Robbins Drain – Cottrellville Twp, P.C. # 252, 253, 568
Smith-Cottrellville Drain – Cottrellville Twp, Section #9, #10
Sykes Drain – Cottrellville Twp, Section #3, #4
Townline of Ira Drain – Cottrellville Twp, Section #6, #7, #18, #19
West Marsh Drain – Cottrellville Twp, Section #9, #16, #20, #21
Wilkins Drain – Cottrellville Twp, Section #2, #11

Sources and Causes of Pollutants and Habitat Degradation:

1. Shoreline habitat replaced (or being replaced) with sea wall

The land-water interface is important to wildlife. The free movement of wildlife in & out of the water is necessary for feeding, reproduction, and escaping from danger. Seawalls prevent these movements and wildlife is killed. The otherwise soil and plant contact aids in pollution

reduction by absorbing suspended materials and recycling them into new material for bank stabilization and wildlife food supplies. The more diversified the shoreline plant growth the more diversified is the animal life. This includes fish life as well. Abundant insect life provides food for fish. Recycling of nutrients in complex food chains disperses pollution.

2. Tributary streams being replaced with enclosed piping

When open drains are replaced with enclosed piping the water life is reduced to anaerobic life forms that live in darkness and unoxygenated conditions. The resulting anaerobic processes further reduce opportunities for oxygen-producing plant life to release oxygen for downstream animal life. Dead zones occur downstream with foul gases being released along with fish kills. The septic conditions are repulsive to humans and provide a breeding ground for lower life forms such as virus and bacteria. Migrating or spawning fish are unable to pass such areas and fish eggs are destroyed.

3. Residential building encroachment upon watercourses

The encroachment of a building upon a drain right-of-way is frequently remedied with pipe enclosures. Piping provides opportunities for unseen tap-ins (illicit connections) to take place. Polluting discharges are harder to trace back to the source when drains are enclosed. The fixed diameter of piping next to a building prevents future enlargement when the drainage district expands upstream. In the crowding of watercourses critical wetlands and natural habitat are destroyed. Re-routing around "lot lines" creates hydraulic bottlenecks and erosion sites during peak flows. Likelihood of direct runoff from driveways, roofs and manicured lawns (with fertilizers and pesticides) is increased.

4. Lack of soil erosion control on farms and development sites

Buffers of vegetative cover are destroyed where farm pasture includes the banks of watercourses, or where crop farming is too close to the stream. Plowing is sometimes right over the edge of the bank. Field drain ditches often erode at the outlet to the drain, or carry large amounts of soil from the fields into the drain.

Over-pasturing of farm fields leads to excessive vegetation wear (by hooves) and soil erosion in the form of stream sedimentation. Streambank erosion becomes excessive where livestock traffic caves in animal burrows (muskrat, woodchuck). Over-grazing leads to the destruction of shade trees and shrubs. Horses can be especially harmful to woody vegetation. Animal hoof traffic can damage soil-stabilizing tree roots.

Fences should be utilized along streamsides to eliminate re-occurring soil erosion problems caused by livestock. Farmers need to sacrifice enough crop land and pasture to stabilize the existing soil types. The more unstable the soil type, the wider buffer strips should be. Sandy soils require a wider setback from the top of the bank.

Soil stabilization is a problem on construction sites, also. Deep excavations expose glacial subsoils. Normally, topsoils contain measurable amounts of organic matter with useful fungi, bacteria and other organisms that aid in plant re-establishment. If the topsoil is buried or trucked away for profit, re-establishment of vegetation can be slowed. Several years or decades may pass before soil-stabilizing lifeforms become re-established.

It is common knowledge that silt fencing is required on construction sites near watercourses. Problems arise when insufficient structures are lacking during construction and particularly during culvert installations. The lack of follow-up inspections leaves building sites subject to soil erosion problems particularly after work crews leave the job site. After the fact inspectors will find plastic silt fencing washed out, buried, or transported in downstream deposits.

5. Obstructions (human-caused and development-worsened) on tributary watercourses

High flows exacerbated by developmental runoff move debris around from one part of a watercourse to downstream areas. The lack of maintenance creates the most common watershed problems. Jams and dams of trees, brush, and man-made junk deflect water flows into stream banks, causing erosion. Suspended soils kill aquatic life by burying eggs or plugging the gills of fish. Some woody debris is necessary for wildlife habitat. Fish hide in brush piles and stump root zones. Insects and snails lay eggs upon twigs and pieces of bark. Leaves and vegetation provide food for the same. Amphibians such as frogs and salamanders overwinter in debris piles. These areas provide feeding areas for raccoons and mink. But dams and obstructions have been made worse by human activities, and careful, limited maintenance is necessary to provide good habitat while stopping excessive erosion and flooding.

6. Stockpiling of foreign materials near watercourses

The stockpiling of foreign materials near watercourse can create unwanted problems. The action of wind, water, and gravity can put unwanted objects in flow areas creating jams and plugging pipes. Lumber, pallets, firewood, fencepost, tires, tarps, cement blocks, and bricks gravitate to downslope areas. It has become a common practice within the watershed to store such items along watercourses.

7. Dumping of refuse near watercourses

The dumping of yard refuse near watercourses is another problem in the watershed. Grass clippings and leaves dumped excessively on ditch banks prevent the growth of soil-stabilizing rooted plants. Manures and pet wastes dumped in close proximity to watercourses contaminate the water with excessive nutrients. Toxic pools of nutrients kill local streamlife. Unwanted wildlife such as: woodchucks, skunks, and rodents burrow into loose piles of refuse. Pet waste dumped near waters can also release parasites that invade aquatic hosts (i.e. waterfowl, crustaceans, turtles, and fish). A world unfit for wildlife can be unfit for humans. “Swimmer’s itch” is the result of aquatic parasites. Many well-kept yards contain refuse or dump piles near watercourses (out of sight and out of mind).

8. Lack of adequate septic systems

Watershed evidence suggests that excessive nutrients and bacteria are finding their way into local watercourses. Failing septic systems and drainfields (or lack of), are located by “dead zones” of black muck, where “cheater pipes” (outflow pipes) exist. Vegetative changes from “normal” to “excessive” are often indications of a sewage outfall.

The growth of nightshade vines (Solanum species) or purple loostrife (Lythrum salicaria) can be used to locate such sewage outfalls. In dry weather pipes can be traced by observing “dark green” grass fed from moist nutrient-laden sources. Blue-green algae in watercourses can occur downstream from nutrient pollution sources. Bright-green algae indicates nutrients, but in lesser quantities.

Older farm homes were built before pollution concerns. “Straight pipes” (direct from the house plumbing) frequently discharge to the ditch closest to the wall lines of the house.

Daylillies (Hemerocalis species) or lilac (Syringa species) bushes, thrive upon the nutrients and water supplied by the pipe, and planting done in the past can conceal the outfall with leafy growth.

Improper installation of pipes can contribute to watershed pollution. “Cheater pipes” are pipes used to drain off excessive liquids from failing drainfields. “French drains” are also used to conceal excessive sewage flows and leach them in to subsurface gravel or stone.

Sewage outfalls can be located during seasons of snow cover and cold weather. Sewage outfalls contain warm water that melts the normal ice cover. Laundry water can be traced by following airborne fragrances contained in the soaps.

9. Poorly designed stream crossing structures

Landowners in the watershed create stream crossings for vehicles and foot traffic. Hunters and recreationists like to keep their feet dry. It is popular to build footbridges from inferior materials. Often the building materials are second quality: i.e. pallets, scrapwood, used culverts, or occupational materials: i.e. scrap steel, concrete blocks, bricks, tires, and treated scrapwood. Poorly constructed bridges wash away during high flows creating constrictions in the form of debris jams. Jams in the waterway erodes soil from the stream banks.

Bridges or culverts that are too small can lead to hydraulic problems, erosion and flooding.

Recreational vehicles and tractor owners are often content with crossing watercourses on unimproved fords. Tires rut up soil surfaces and destroy rooted vegetation causing sedimentation, and suspension of soil particles. Aquatic life forms may be destroyed in the process.

10. Destruction of wetland areas

The destruction of regulated and small, unregulated wetland areas is another problem. Unnecessary mowing can occur when local mowing ordinances and noxious weed ordinances favor close cutting to make “neat and pretty” appearances of functioning wetland vegetation. Plant growth can absorb suspended particles of soil, drops of oil, or minor pollutants. Wetland plants need to mature in order to produce food and cover for wildlife. The human mindset of “proper appearances” can diminish wetland functions. Standing waters can be an irritant to uninformed people who would rather fill low areas of the yard with soil and mow and manicure wildlife wetlands away in the name of mosquito control. Stands of native grasses are often destroyed in favor of alien lawn species.

Native grasses have deeper root systems with greater soil erosion stabilization ability.

11. Road salt damage

Many culverts are destroyed by road salts. Salt used to melt snow corrodes many of the metal culverts in the watershed. Tubes with no bottoms may collapse or expose the soil to water erosion.

The chloride salts used to control dust on gravel roads can deteriorate metal structures also. These salt brines from underground wells can destroy bridge railings, pavement grates and anchor bolts on road structures.

Salts in the watershed can alter the vegetation in the watershed. Some plants such as Common Reed (Phragmites) thrive in salted conditions while most native plants are stunted or killed by chloride compounds.

Salts can deteriorate concrete structures leading to collapse of headwalls and bridge decks.

12. Lack of enforcement of environmental laws

There are many good laws and ordinances to protect habitat and water quality, if only they were enforced. A walk through the watershed shows there is very little enforcement of existing laws. Government mandates for action fall upon deaf ears if there is not financial backing for pollution programs. Economic gains are put ahead of pollution concerns.

13. Direct runoff from dense residential developments, parking lots and roadways

Watercourses should not be crowded by densely concentrated human activity. Mobile home parks in the watershed have a concentration of human activity that puts pollution into watercourses. The impervious surfaces (such as pavement driveways and cul-de-sacs) collect polluted liquids in the forms of: soaps, oils, salts, herbicides, and dissolved metals. These materials are funneled directly into watercourses with no treatment.

14. Leaking valves and embankments at water treatment facilities

Sewage treatment and holding ponds should not be located by watercourses. Leaking embankments or leaking valves release concentrated pollutants to watercourses.

15. Unlimited livestock access to streams

The location of livestock pasture should not allow access to watercourses with standing water. It is not necessary to have horses or cattle standing in water in order to get a drink (Livestock tends to defecate while standing in water).

16. The loss of floodplain function when natural watercourses are altered as drains

Efforts to create dry land for human activity have had negative effects upon flood control and water quality. Many county drains in the watershed were once meandering watercourses, but have been filled in and or straightened. The usual process is to dig a straighter channel and to pile the resulting spoils (soils) as piles upon the new banks. Some soil is used to fill in side wetlands or unwanted meanders. The resulting arrangement reduces the stream capacity to store floodwaters. The water rushes downstream untreated. Often tributary runoff is trapped in isolated stagnant pools behind the spoil piles.

The overland spilling of floodwater in a meandering stream-floodplain system is an important process. In the process of flooding, a natural process of water purification takes place. The landward spilling of dead fish, animal carcasses, wild seeds, nutrients, and pollution creates opportunities for solids to be absorbed. Through complex interaction between plants and animals particulate matter is cycled and recycled in food webs. As a result of such activity the water becomes cleaner.

The water purification process functions best if adequate space exists for wetland plants and interactions. Floodplain wetlands in the form of stream meanders and connected low-lying pools, provide the best system for nutrient transport and removal.

Floodplain vegetation is more lush because of abundant soil nutrients and diversified seed supplies from upstream areas. The highly diversified plants create more opportunities for wildlife feeding. The natural movement of stream channels creates soil "seed beds" for plants and feeding areas for animals. Low lying wetlands and floodplain woods also function as a habitat nursery for waterfowl, shorebirds, reptiles, amphibians, and insects (food supplies). Insects chew upon plant materials and nutrients are released. Through the interactions of fungi (mushrooms) and bacteria water is further purified beneath the cooling shade of vegetation.

Extra water may find its way along root channels of plants and eventually recharge ground water supplies. These floodplain functions are greatly reduced when meandering streams are prevented, and low lying wetlands are filled. (Watershed streams that have had such alteration include: Beaubien Creek, Crapaud Creek, Marsac Creek, Peters Drain, Dana Drain, Hessen Drain, West Marsh Drain and others.)

17. Children playing in watercourses

Since the beginning of time, children have been attracted to playing in watercourses. In a healthy stream waterlife in the form of minnows, turtles, frogs, tadpoles, and “waterbugs” can be a natural attraction. Problems arise when waters are polluted so kids face health risks and also when children vandalize watercourses by building “dams” or bridges from discarded materials, and throw trash in the streams. A life-long respect for watercourses could prevent such activities and channel efforts toward habitat improvements.

18. General lack of education and values that promote watershed protection

Walking the tributary watercourses clearly indicates that there is a lack of education affecting water quality in the Anchor Bay Watershed. Traditional values of the past have allowed practices that cannot be tolerated today. Pollution of public waters by sewage outfalls can no longer be allowed as population density increases. The pasturing of waterways by horses or cattle today effects nearby neighbors. We should not complain about the heron eating fish from our stocked pond if the waters are void of fish because of pollution. We need not complain about mosquitoes if we have destroyed their natural predators through habitat destruction. The over-spraying of lawn pesticides may interrupt the food chain by killing songbirds that feed upon insect pests. We should not complain about water quality if we are content to have a swimming pool and then back-flush it into a nearby waterway. We cannot become stewards of land if we live in rented housing and dispose of car batteries and dump used oil on the ground (because the landlord is too busy to notice). The ownership of land creates a connection between humans and nature. The “use and dump” mentality is less likely to occur if one stays upon the land, in the same locality. Land and water stewards plant trees, dig ponds, hunt, go for nature walks, watch birds, fish, and perform activities that increase awareness of land and water. Native Americans lived and survived in the watershed for thousands of years. Stewardship of the land and water was essential to their survival.

Economics may suggest that the construction of boat slips (tourist dollars) be put ahead of shoreline habitat preservation. Canal lots and waterside lots with boat slips may bring extra dollars to developers and real estate agents. Steel seawalls may allow manicured lawn sod up to the waters edge. Manicured lawns demand year-long spraying programs (sometimes continuing into winter months).

Spray and fertilizers can wash into the water killing fish. Fish are then harder to locate requiring distant trips across the lake. Distant trips require: food, fuel, and facilities. Long trips create sewage that needs to be disposed of.

Congestion and cost at onshore pumping stations is avoided by dumping sewage offshore. Bacteria from sewage kills fish. Dying fish create nutrients and weed growth. Nutrients, weed, and bacteria drift shoreward. Shoreside pollution closes beaches. People buy swimming pools to avoid polluted water. Swimming pools isolate people from the environment. Chlorine is added to the water to control algae. Algae and dirt are back-flushed into watercourses. Water quality is degraded.

Swimming in a pool becomes routine. Routines can be remedied by vacations. Vacations require travel. Travel to distant watershed requires: campers, motorhomes, and boats.

From long trips we bring back exotic pests and sewage. Lake weeds and strange fish show up in local waterbodies. The fish are “bait stealers”. The bait stealers are killed and tossed back into the water. Dead fish create bacteria and nutrients. Beaches are closed. Public outcry demands pollution-controlling action. Government action requires careful politics. Careful politics require government reports. Government reports have economic repercussions.

Aldo Leopold in his book: *A Sand County Almanac*, states: “In order to make conservation easy, we have made it trivial”. He believed that paying people to do conservation work will never accomplish long term goals. Economic funding when cut off kills programs.

Improving water quality in the Anchor Bay Watershed will require many changes in current practices and values.

Long term goals in improving water quality require improvement in environmental education and land use planning.

Environmental education needs to play a part in teaching the public to be aware and concerned with the world they live in. This education should be a life-long process, with an emphasis on the long term changes in culture.

Our current culture has put an emphasis on “athletic sports”. This focus dominates by taking funding and time away from environmental education possibilities. Strong economic interests control monies associated with athletic sports. Clothes, trophies, and awards promote a competitive aura, which is short lived once educational money is spent. Conservation education is limited to a day of outdoor activity (in the fifth or sixth grade).

Good conservation requires land use planning. As the population of a watershed grows, control of public access becomes an issue.

Wildlands and waterways are perceived to be public property. Woodlot corners become dumping grounds for spent consumer goods. Wooded lanes and drainage ways become travel ways for unauthorized public access. Concentrated traffic degrades habitat and spooks wildlife. Water quality is also degraded. Local ordinances are enacted but damages continue without enforcement. Government ownership of land is perceived a “heavy-handed control” by “big brother”.

Land use is perceived by some as a right of land ownership. Taxpayers feel justified in doing what they please (disregarding public benefit of losses).

The current practice of creating public pathways for bicycles should serve as a model for long-range land use planning. The watershed-wide extensions and connections beyond political boundaries has gone beyond traditional efforts for multidisciplinary cooperation.

In a similar manner, waterways should be protected for the common public benefit. Buffer zones or greenbelts should be established along watercourses to assure water quality maintenance.

The protection of headwaters is critical. Migrating fish move upstream and in order to survive, headwaters must be clean and pure. Wetland “buffer zones”, or vegetative belts, are necessary to filter out pollution, sediments, and other materials that degrade water quality. Watercourses need space to make hydraulic and seasonal adjustments as flow conditions change. Habitat space, in the form of vegetation, buffers wildlife from human activity.

Location of Examples of Sources and Causes:

1. Shoreline habitat replaced (or being replaced) with seawalls

St. Clair River and tributaries, i.e. South Algonac
Anchor Bay shoreline, i.e. East Harsens Island (South of Sans Souci)
North Channel shoreline -- island lots created by fill of marshland

2. Tributary Streams being replaced with enclosed piping

Robbins Drain
Hammer Drain
Parker Drain
Geyman Drain
Cottrell & Extension Drain (M-29 area)
Crowley Drain
Parquett Drain
Clippert Drain
Cartwright Drain

3. Residential building encroachment upon watercourses

Cottrellville & Extension Drain– M-29 & south of Carroll Street
Hammer Drain – northside of Highway M-29
Geyman Drain – east of M-29
Cartwright Drain – south of Fruit Road

4. Lack of soil erosion control on farms and development sites

Dana Drain – Clay Twp, Section #9
Crapau Creek Intercounty Drain– Ira Twp, Section #7
Marsac Creek Drain – Ira Twp, Section #8
St. Mary’s Drain, Ira Twp, Section #14
Tributary of Swan Creek, Ira Twp Section #15
Benoit Drain, Casco Twp, Section #31

5. Obstructions (human-caused and development-worsened)

Large tributaries usually the worst:
Beaubien Creek Drain – Cottrellville Twp, Section #19
Marsac Creek Drain – Ira Twp, Section # 5, 8 & 17
West Marsh Drain – Cottrellville Twp, Section #9, 16

6. Stockpiling foreign materials near watercourses

Marsac Creek Drain (east of Church Road) – Ira Twp, Section #8
Benoit Drain (south of Arnold Road) – Ira Twp, Section #7
Benoit & Br #1 Drain – Casco Twp, Section #31
Cartwright Drain (south of Fruit Street) – Clay Twp, City of Algonac

7. Dumping of refuse near watercourses

Cartwright Drain (at Scout St. and south of Fruit St.) – Clay Twp, City of Algonac
Lester-Bammel Drain (West of M-29) – Cottrellville Twp, P.C. 187
Grandchamp Drain – Cottrellville Twp, Section #7 (NE)
Townline of Ira Drain –Cottrellville Twp, Section #18, #19; Ira Twp, Section #24 (E¼ line)

8. Lack of adequate septic systems

Smith-Cottrellville Drain – Cottrellville Twp, Section #9, (SE¼)
Hammer Drain – Ira Twp, Section #23, S. of M-29
Peters Drain – Casco Twp, Section #36
Hessen Drain – Casco Twp, Section #26
West Marsh Drain – Cottrellville Twp, Section #20

9. Poorly designed stream crossing structures

Beaubien Creek Drain – Section #7, 18
Benoit Branch #1 – Casco Twp, Section #31,
Marsac Creek Drain – Ira Twp, Sec. #8 (SW)
Lester-Bammel Drain – Cottrellville Twp

10. Destruction of wetland areas

Arnold Drain – Cottrellville, Section #3 (SW)
Cottrell & Extension Drain – (south of Chartier St. by cemetery) – Marine City
Crapau Creek Intercounty Drain – Ira Twp, Section #7
Benoit Drain – Ira Twp, Section #7, south of Arnold Rd, west of Bethuy Rd.
Dana Drain – Clay Twp Section #9
M-29 west of Algonac – to Palms Road, north & south of M-29
City of Algonac – southern-most points of land
Harsens Island – south of San Souci

11. Road salt damage culverts

Beaubien Creek Drain (Broadbridge Rd. west of Starville) – Cottrellville Twp, Section #18 Arnold
Drain – Cottrellville Twp, Section #3, #4
Sykes Drain – Cottrellville Twp, Section #3, #4
Marsac Creek Drain – Casco Twp, Section #31, collapsed concrete & stone headwall

12. Lack of enforcement of environmental laws

Arnold Drain – north of Arnold, Section #3
Dana Drain – Clay Twp. Section #9

13. Direct runoff from dense residential developments, parking lots & roadways

Marsac Creek Drain (upper)– Casco Twp, Section #30
Marsac Creek Drain (lower) – Ira Twp, Section #7, #8,

14. Leaking valves and embankments at water treatment facilities

Casco Township, Section #30

15. Unlimited livestock access to streams

Beaubien Creek & Grandchamp Drains – Cottrellville Twp, Section #7, #17 & #18

16. The loss of floodplain function when natural watercourses are altered as drains

Casco Drain – Casco Twp, Section #25

Beaubien Creek Drain – Cottrellville Twp, Section #19

Crapau Creek Intercounty Drain – Ira Twp, Section #7

Marsac Creek – Casco Twp, Section #31, Ira Twp, Section #7, 8

Dana Drain – Clay Twp, City of Algonac

Hessen Drain – Casco Twp, Section #26

West Marsh – Cottrellville Twp, Section #20

Peters Drain – Casco Twp, Section #36

17. Children playing in watercourses

Marsac Creek (upper) – Casco Twp, Section #30

Marsac Creek (lower) – Ira Twp, Section #8

Cottrell & Extension Drain – Cottrellville Twp, Marine City

18. General lack of education and values that promote watershed protection

Cartwright Drain – Clay Twp, City of Algonac

Cottrell & Extension Drain – Cottrellville Twp, Marine City

Dana Drain – Clay Twp, City of Algonac

**Anchor Bay Watershed
Management Plan**

**Appendix C:
Crapau Creek TMDL**

**Michigan Department of Environmental Quality
Surface Water Quality Division
January 2002**

**Total Maximum Daily Load for *Escherichia coli* for Crapaud Creek,
Macomb and St. Clair Counties**

INTRODUCTION

Section 303(d) of the federal Clean Water Act and the United States Environmental Protection Agency's (USEPA's) Water Quality Planning and Management Regulations (Title 40 of the Code of Federal Regulations (CFR), Part 130) require states to develop Total Maximum Daily Loads (TMDLs) for waterbodies that are not meeting Water Quality Standards (WQS). The TMDL process establishes the allowable loadings of pollutants for a waterbody based on the relationship between pollution sources and in-stream water quality conditions. TMDLs provide states a basis for determining the pollutant reductions necessary from both point and nonpoint sources to restore and maintain the quality of their water resources. The purpose of this TMDL is to identify the allowable levels of *Escherichia coli* (*E. coli*) that will result in the attainment of the applicable WQS in Crapaud Creek, a small waterbody in Macomb and St. Clair Counties.

PROBLEM STATEMENT

Crapaud Creek was placed on the Section 303(d) list in 1998. This TMDL addresses approximately two miles of Crapaud Creek in the city of New Baltimore. The TMDL reach is on the Section 303(d) list as:

Waterbody: **Crapaud Creek**

WBID#: **061409E**

County: Macomb

RF3RchID: 4090002 303 Size: 2 M

Location: Downtown New Baltimore at Hamer Street.

Status: **2** Problem: **Pathogens (Rule 100).**

TMDL YEAR(s): 2000

Crapaud Creek (Figures 1 and 2) was placed on the Section 303(d) list due to impairment of recreational uses by the presence of elevated levels of *E. coli*. Data collected in the vicinity of New Baltimore by the Macomb County Health Department began documenting elevated *E. coli* levels in 1996. A review of the available data indicated elevated levels of *E. coli* in at least 50% of the samples collected since 1996, with particularly high results in 1999. Data for 1999 indicated elevated levels for *E. coli* in over 90% of the samples collected (Macomb County Health Department, 2001). Monitoring data (Appendix 1) collected by the Michigan Department of Environmental Quality (MDEQ) in 2001 documented continued exceedances of the WQS at all five stations sampled (Table 1). Geometric means for the 2001 sampling period exhibited elevated levels (Figure 3), especially at the upstream stations. Monthly geometric mean *E. coli* concentrations in 2001 ranged from 66 *E. coli* per 100 milliliters (ml) in July at Green Road to 2,417 *E. coli* per 100 ml in June at Ashley Street, as summarized in Table 1 and Figure 4. The highest value found (80,000) was in the downstream area at Athea Street, but consistently high values were found in the upstream area at Ashley and Perrin Streets.

Table 1. MDEQ *E. coli* data for Crapaud Creek, New Baltimore, Michigan, in 2001.

Sample Location	Month	E. coli concentration (#/100 ml)			# of results
		Minimum	Geometric mean	Maximum	
*Ashley St.	June	2,100	2,417	2,800	3
	July	610	1,101	2,000	12
	August	230	955	7,000	12
Private Dr./Perrin St.	May	2,100	2,186	2,260	3
	June	480	714	1,400	12
	July	370	1,183	4,800	12
	August	400	649	1,400	12
Green Rd.	May	130	172	230	3
	June	10	159	6,900	12
	July	10	66	860	12
	August	10	137	2,100	12
Athea Br./Main St.	May	90	260	810	3
	June	380	770	1,300	12
	July	130	945	80,000	12
	August	10	119	1,900	12
**Bal Clair	May	90	109	120	3
	June	50	158	320	9

*modified sample location - partial data

**sample location changed during monitoring period - partial data

NUMERIC TARGET

The impaired designated use for Crapaud Creek at this location is total body contact recreation. Rule 100 of the Michigan WQS requires that this waterbody be protected for total body contact recreation from May 1 to October 31. The target levels for this designated use are the ambient *E. coli* standards established in Rule 62 of the WQS as follows:

R 323.1062 Microorganisms.

Rule 62. (1) All waters of the state protected for total body contact recreation shall not contain more than 130 *Escherichia coli* (*E. coli*) per 100 milliliters, as a 30-day geometric mean. Compliance shall be based on the geometric mean of all individual samples taken during 5 or more sampling events representatively spread over a 30-day period. Each sampling event shall consist of 3 or more samples taken at representative locations within a defined sampling area. At no time shall the waters of the state protected for total body contact recreation contain more than a maximum of 300 *E. coli* per 100 milliliters. Compliance shall be based on the geometric mean of 3 or more samples taken during the same sampling event at representative locations within a defined sampling area.

In addition, there are two permitted wastewater treatment plant (WWTP) discharges to Crapaud Creek, which have an additional target:

Rule 62. (3) Discharges containing treated or untreated human sewage shall not contain more than 200 fecal coliform bacteria per 100 milliliters, based on the geometric mean of all of 5 or more samples taken over a 30-day period, nor more than 400 fecal coliform bacteria per 100 milliliters, based on the on the geometric mean of all of 3 or more samples taken during any period of discharge not to exceed 7 days. Other indicators of adequate disinfection may be utilized where approved by the department.

The WWTP discharges will be considered in compliance with the WQS of 130 *E. coli* per 100 ml if their National Pollutant Discharge Elimination System (NPDES) permit limit of 200 fecal coliform per 100 ml as a monthly average is met. This is assumed because *E. coli* are a subset of fecal coliform (American Public Health Association, 1995). When the wastewater of concern is sewage, fecal coliform is substantially higher than *E. coli* (Whitman, 2001). When the point source dischargers are disinfecting their effluent and meeting their limit of 200 fecal coliform per 100 ml, it can reasonably be assumed that there are less than 130 *E. coli* per 100 ml in the effluent.

For this TMDL, the WQS of 130 per 100 ml as a 30-day geometric mean is the target level for the TMDL reach from May 1 to October 31. As previously stated, data collected by the MDEQ in 2001 documented *E. coli* exceedances at all five stations sampled (Table 1). This is consistent with elevated levels found by the Macomb County Health Department in 1996 and 1999.

SOURCE ASSESSMENT

The Crapaud Creek watershed is located in both Macomb and St. Clair Counties. The listed TMDL reach is upstream from Hamer Street in the city of New Baltimore, Macomb County, extending into St. Clair County (Figure 1). There are two permitted point source discharges to Crapaud Creek, the city of New Baltimore WWTP and Millstone Pond Mobile Home Park WWTP. Municipalities in Macomb County include the city of New Baltimore, Lenox Township, and Chesterfield Township. The remaining municipalities, Casco Township and Ira Township, are located in St. Clair County. Table 2 shows the distribution of land in the Crapaud Creek watershed for each municipality.

Table 2. Distribution of land for each municipality in the Crapaud Creek watershed.

Municipality	County	Watershed Area (sq. mi)	Percent Land Area in Watershed
Lenox Township	Macomb	0.8	11
Casco Township	St. Clair	1.1	15
Chesterfield Township	Macomb	0.9	13
Ira Township	St. Clair	1.6	22
City of New Baltimore	Macomb	2.8	39
TOTAL		7.2	100

Potential pathogen sources for this waterbody include sources typically associated with urban and agricultural land uses. The 2001 monitoring data was collected during typical stream flow conditions and is indicative of both continuous and storm event inputs. Potential inputs of *E. coli*

include the two permitted point sources, as well as illicit sewer connections and urban runoff, since a majority of the watershed lies within New Baltimore. Other possible sources include agricultural runoff and pet and wildlife feces.

LINKAGE ANALYSIS

The link between the *E. coli* concentration in Crapaud Creek and the potential sources is the basis for the development of the TMDL. The linkage is defined as the cause and effect relationship between the selected indicators and the sources. This provides the basis for estimating the total assimilative capacity of the creek and any needed load reductions. For this TMDL, the primary loading of pathogens likely enters Crapaud Creek by both continuous and storm water related nonpoint sources.

Due to insufficient flow upstream, sampling in 2001 began where there was an obvious stream channel and adequate water. The guiding water quality management principle used to develop the TMDL was that compliance with the numeric pathogen target in Crapaud Creek depends on the control of point source *E. coli*, and the control of *E. coli* in storm water and illicit connections. If the *E. coli* inputs can be controlled, then total body contact recreation in Crapaud Creek will be protected.

TMDL DEVELOPMENT

The TMDL represents the maximum loading that can be assimilated by the waterbody while still achieving WQS. As indicated in the Numeric Target section, the target for this pathogen TMDL is the WQS of 130 *E. coli* per 100 ml. Concurrent with the selection of a numeric concentration endpoint, TMDL development also defines the environmental conditions that will be used when defining allowable levels. Many TMDLs are designed around the concept of a “critical condition.” The “critical condition” is defined as the set of environmental conditions that, if controls are designed to protect, will ensure attainment of objectives for all other conditions. For example, the critical conditions for the control of point sources in Michigan are given in R 323.1090. In general, the lowest monthly 95% exceedance flow for streams is used as a design condition for point source discharges. However, for pathogens in point source discharges of treated or untreated human sewage, levels are restricted to a monthly average limit of 200 per 100 ml for fecal coliforms regardless of stream flow. Therefore, the design stream flow is not a critical condition for determining the allowable loadings of pathogens for WWTPs. In addition, other *E. coli* sources to Crapaud Creek arise from a mixture of wet and dry weather-driven nonpoint sources, and there is no single critical condition that is protective for all other conditions. For these sources, there are a number of different allowable loads that will ensure compliance, as long as they are distributed properly throughout space.

For most pollutants, TMDLs are expressed on a mass loading basis (e.g., pounds per day). For *E. coli*, however, mass is not an appropriate measure, and the USEPA allows pathogen TMDLs to be expressed in terms of organism counts (or resulting concentration). Therefore, this pathogen TMDL is concentration-based consistent with R 323.1062, and the TMDL is equal to the target concentration of 130 *E. coli* per 100 ml.

For this TMDL, an allocation strategy for nonpoint sources has been selected that assumes equal bacteria loads per unit area for all lands within the watershed. The point sources are handled consistent with Rule 62(3). The allocation process for each month of the recreational season (May through October) is outlined below.

1. This TMDL is concentration-based so the TMDL is equal to the pathogen WQS of 130 *E. coli* per 100 ml.
2. The WWTP discharges for Crapaud Creek will be considered in compliance with the WQS of 130 *E. coli* per 100 ml if their NPDES permit limit of 200 fecal coliform per 100 ml as a monthly average is met. As previously discussed, this is assumed because *E. coli* are a subset of fecal coliform (American Public Health Association, 1995). When the wastewater of concern is sewage, fecal coliform is substantially higher than *E. coli* (Whitman, 2001). When the point source dischargers are disinfecting their effluent and meeting their limit of 200 fecal coliform per 100 ml, it can reasonably be assumed that there are less than 130 *E. coli* per 100 ml in the effluent.

Consistent with the allocation strategy, Table 3 shows the TMDL or allowable concentrations for *E. coli* by applicable month in the Crapaud Creek watershed.

Table 3. Allowable *E. coli* concentrations by month in the Crapaud Creek watershed.

	May	June	July	August	September	October
Crapaud Creek	130	130	130	130	130	130

ALLOCATIONS

TMDLs are comprised of the sum of individual Waste Load Allocations (WLAs) for point sources and Load Allocation (LAs) for nonpoint sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, that accounts for uncertainty in the relation between pollutant loads and the quality of the receiving water body. Conceptually, this definition is denoted by the equation:

$$\text{TMDL} = \sum \text{WLAs} + \sum \text{LAs} + \text{MOS}$$

The term TMDL represents the maximum loading that can be assimilated by the receiving water while still achieving WQS. The overall loading capacity is subsequently allocated into the TMDL components of WLAs for point sources, LAs for nonpoint sources, and the MOS. As previously indicated, this pathogen TMDL will not be expressed on a mass loading basis and is concentration-based consistent with USEPA regulations at 40 CFR, Section 130.2(1).

WLAs

The city of New Baltimore (MI0023680) has a permitted WWTP discharge to Crapaud Creek (labeled on Figure 1 and 2). This facility has a design flow of 1.75 million gallons per day (MGD) and has a limit of 200 fecal coliform per 100 ml as a monthly average. The Millstone Pond Mobile Home Park (MI0055816) is permitted to discharge to an unnamed tributary to Crapaud Creek (labeled on Figure 1). This facility has a design flow 0.14 MGD and also has a limit of 200 fecal coliform per 100 ml as a monthly average in their NPDES permit. As previously stated, when the WWTPs are disinfecting their effluent, the WQS is required to be met in the discharge. Therefore, the WLA will be equal to 130 *E. coli* per 100 ml.

LAs

Because this TMDL is concentration-based, the LA is equal to 130 *E. coli* per 100 ml and the determination of individual LAs will be based on the assumption of equal bacteria loads per unit area for all lands within the watershed. Therefore, the relative responsibility for achieving the necessary reductions of bacteria and maintaining acceptable conditions will be determined by the amount of land under the jurisdiction of the various local units of government within the watershed. Table 2 gives the relative LAs for each of the local entities as shown by the percentage of land within the watershed for each of the local units of governments. This gives a clear indication of the relative amount of effort that will be required by each entity to restore and maintain the total body contact designated use to Crapaud Creek.

The government entities with the largest percent land area in the Crapaud Creek watershed are the city of New Baltimore (39%) and Ira Township (22%), making up 61% of the watershed. Lenox Township (11%), Casco Township (15%), and Chesterfield Township (13%) compromise the rest of the watershed.

MOS

This section addresses the incorporation of an MOS in the TMDL analysis. The MOS accounts for any uncertainty or lack of knowledge concerning the relationship between pollutant loading, water quality, and knowledge of continuous point sources of *E. coli*. The MOS can be either implicit (i.e., incorporated into the TMDL analysis through conservative assumptions) or explicit (i.e., expressed in the TMDL as a portion of the loadings).

This TMDL uses an implicit MOS for two reasons: no rate of decay for *E. coli* was used, and actual disinfection performance by the point sources is much better than their permitted levels.

It is expected that both WWTP discharges to Crapaud Creek are discharging at well below their permit limit of 200 fecal coliform per 100 ml, which allows a reasonable MOS in Crapaud Creek. This expectation is based on data submitted from the New Baltimore WWTP discharge on their Discharge Monitoring Report. Data submitted from the city of New Baltimore since 1998 average approximately 22 fecal coliform per 100 ml. The maximum concentration was 62 per 100 ml, well below their 200 per 100 ml permit limit. Millstone Pond Mobile Home Park has not commenced discharge but will use ultraviolet disinfection, which is highly effective at killing pathogens.

Monitoring data also indicates that the city of New Baltimore's effluent has a diluting effect on *E. coli* levels in Crapaud Creek. This is shown by a dramatic decrease in *E. coli* at the Green Road station, just downstream of New Baltimore's discharge entering Crapaud Creek. Figure 5 shows the percent composition of Crapaud Creek at the city of New Baltimore WWTP outfall at average stream flow and design flow conditions for the WWTPs. The city of New Baltimore WWTP effluent makes up 85% of the flow of Crapaud Creek. The combined WWTP flow makes up 90% of the stream flow when Millstone Stone Pond Mobile Home Park effluent is included.

Example Loading Assessment

Although this TMDL is concentration-based, an example calculation using counts per day was used to simulate a loading assessment. The TMDL, on a loading basis, can be calculated as a function of stream flow using the following equation:

$$\text{TMDL} = Q_{\text{riv}, x} \times C_{\text{WQS}}$$

Where:

TMDL = Loading capacity in the stream (counts per time).

$Q_{\text{riv}, x}$ = Stream flow (volume of water per time).

C_{WQS} = WQS concentration (counts per volume of time).

The loading capacity defined in the above equation applies to all stream flows for which WQS apply. The monthly average flows for Crapaud Creek are given in Table 4 and demonstrate the relative magnitude of allowable loads from the various units of government for one flow scenario. Table 5 represents the monthly average flows for Crapaud Creek, including the WWTP flows and were used to calculate the total allowable load to Crapaud Creek.

Table 4. Crapaud Creek average flows (cfs) just upstream of New Baltimore WWTP discharge.

May	June	July	August	September	October
1	0.4	0.1	0.1	0.1	0.2

Table 5. Crapaud Creek average flows (cfs), including the New Baltimore WWTP and Millstone Pond Mobile Home Park WWTP flows.

May	June	July	August	September	October
3.9	3.3	3.0	3.0	3.0	3.1

Using the previously stated conditions from the allocation strategy, the allocations based on average flow conditions were determined using the following process:

1. For Crapaud Creek, the allowable concentration was converted to allowable load.
2. LAs were determined for each local entity based on the relative areas of jurisdiction. The results are given in Table 6.
3. WLAs were determined for New Baltimore WWTP and Millstone Pond Mobile Home Park WWTP using a design flow of 1.75 MGD and 0.14 MGD, respectively. Using this flow, a discharge equivalent to 130 *E. coli* per 100 ml and the formula noted in Table 7, New Baltimore WWTP has a WLA of 8.6 relative loading units and Millstone Pond Mobile Home Park WWTP has a WLA of 0.70 relative loading units.
4. The Crapaud Creek flows used in calculations for the LA were taken just upstream of the city of New Baltimore WWTP outfall. The flow data was provided by the Hydrology Unit, Land and Water Management Division, MDEQ.

5. The TMDL total load was calculated using the total flow for Crapaud Creek, which was calculated using the design flow of the WWTPs and the formula noted in Table 7.

The results of the loading assessment for the listed reach of Crapaud Creek under average flow conditions are given in Table 7. The assessment shows that if the WLA and LA are met, the TMDL will not be exceeded in Crapaud Creek for each month of the recreational season.

Table 6. LAs for Crapaud Creek watershed for average flow (relative loading units*).

	Watershed area (sq. mi)	May	June	July	August	September	October
Lenox Twp.	0.8	0.35	0.14	0.04	0.04	0.04	0.07
Casco Twp.	1.1	0.48	0.19	0.05	0.05	0.05	0.1
Chesterfield Twp.	0.9	0.42	0.17	0.04	0.04	0.04	0.08
Ira Twp.	1.6	0.70	0.29	0.07	0.07	0.07	0.14
City of New Baltimore	2.8	1.25	0.51	0.12	0.12	0.12	0.25
TOTAL	7.2	3.2	1.3	0.32	0.32	0.32	0.64

*Relative Loading Units = *E. coli* concentration (130 counts/100 ml) x River flow (cfs) x (10 x .646 x 3.785) / 10³

Table 7. TMDL for Crapaud Creek, May 1 to October 31 (relative loading units)*.

	May	June	July	August	September	October
WLA	9.3	9.3	9.3	9.3	9.3	9.3
LA	3.2	1.3	0.32	0.32	0.32	0.64
TOTAL LOAD (TMDL)	12.5	10.6	9.62	9.62	9.62	9.94

*relative loading unit = *E. coli* concentration (130 cts/100 ml) x River flow or effluent flow (cfs) (10 x .646 x 3.785)/10³

SEASONALITY

Seasonality in the TMDL is addressed by expressing the TMDL in terms of a total body contact recreation season that is defined as May 1 through October 31 by R 323.1100 of the WQS. There is no total body contact during the remainder of the year primarily due to cold weather. In addition, because this is a concentration-based TMDL, WQS will be met regardless of flow conditions in the applicable season.

MONITORING

In 2001, water quality was monitored at five stations from May through August (Figure 2). Sampling was dependant upon adequate flow in the creek and data was not collected at all stations on every sampling event. Additional sampling will begin in May 2002 and conclude in

September 2002. If initial sampling in 2002 indicates WQS are exceeded, the remaining sampling will be oriented toward source identification. If these results indicate that the waterbody may be meeting WQS, sampling will be conducted at the appropriate frequency to determine if the 30-day geometric mean value of 130 *E. coli* per 100 ml is being met.

In future years, assuming WQS are not met immediately, sampling frequency will be weekly from May through September at appropriate locations. Sampling will be adjusted as needed to assist in continued source identification and elimination. When these results indicate that the waterbody may be meeting WQS, sampling will be conducted at the appropriate frequency to determine if the 30-day geometric mean value of 130 *E. coli* per 100 ml is being met.

REASONABLE ASSURANCE ACTIVITIES

Under the NPDES permit program, the two WWTP dischargers are responsible for meeting their effluent limits for fecal coliform. Compliance is determined based on review of Discharge Monitoring Report data by the MDEQ. As previously stated, the WWTP dischargers in the watershed are presently disinfecting their effluent well below their permitted limits.

Urban storm water runoff and illicit discharges are likely the dominant sources of *E. coli* to Crapaud Creek. Implementation activities to meet the TMDL require measures to reduce *E. coli* sources and loads. Under the Phase 2 storm water regulations, the need for storm water permits in the other municipalities in the watershed will be evaluated against the applicable criteria on a case-by-case basis. These requirements are likely to apply to the city of New Baltimore, Chesterfield Township and Ira Township. These permits will require activities that reduce pathogen inputs, similar to the existing Phase 1 storm water permits in more populated urban areas.

In addition, Macomb and St. Clair Counties have been awarded a Section 319 Watershed Management Grant that will include activities to reduce and eliminate sources of *E. coli*. This grant is titled the "Anchor Bay Watershed Project" and includes Crapaud Creek. The goal of this grant is to develop a comprehensive nonpoint source watershed management plan. Objectives of the plan include the identification and correction of failing septic systems and the control of urban and agricultural storm water runoff. The grant is funded in the amount of \$91,252.00 with a local match of \$103,868 for a total of \$195,120.00.

Prepared by: Christine Thelen, Aquatic Biologist
Great Lakes and Environmental Assessment Section
Surface Water Quality Division
Michigan Department of Environmental Quality
January 22, 2001

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- Creal, W. and J. Wuycheck. 2000. Federal Clean Water Act Section 303(d) List – Michigan's Submittal for Year 2000. Michigan Department of Environmental Quality, Surface Water Quality Division, Report Number MI/DEQ/SWQ-00/018.
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WWW.co.macomb.mi.us/publichealth/waterquality/monthass/SALT - MILK - CRAPAUD.
- Personal communication, Richard L. Whitman. United States Geological Survey, October 2001.
- USEPA. 2001. Protocol for Developing Pathogen TMDLs. United States Environmental Protection Agency, 841-R-00-002.

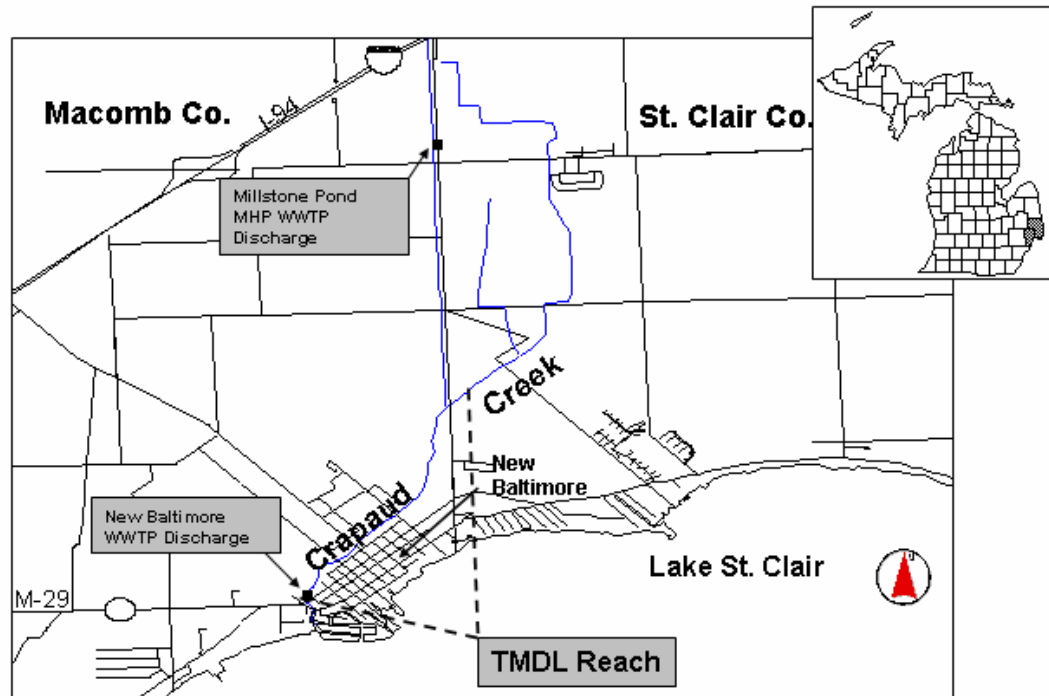


Figure 1. Crapaud Creek Watershed with point source discharge locations.

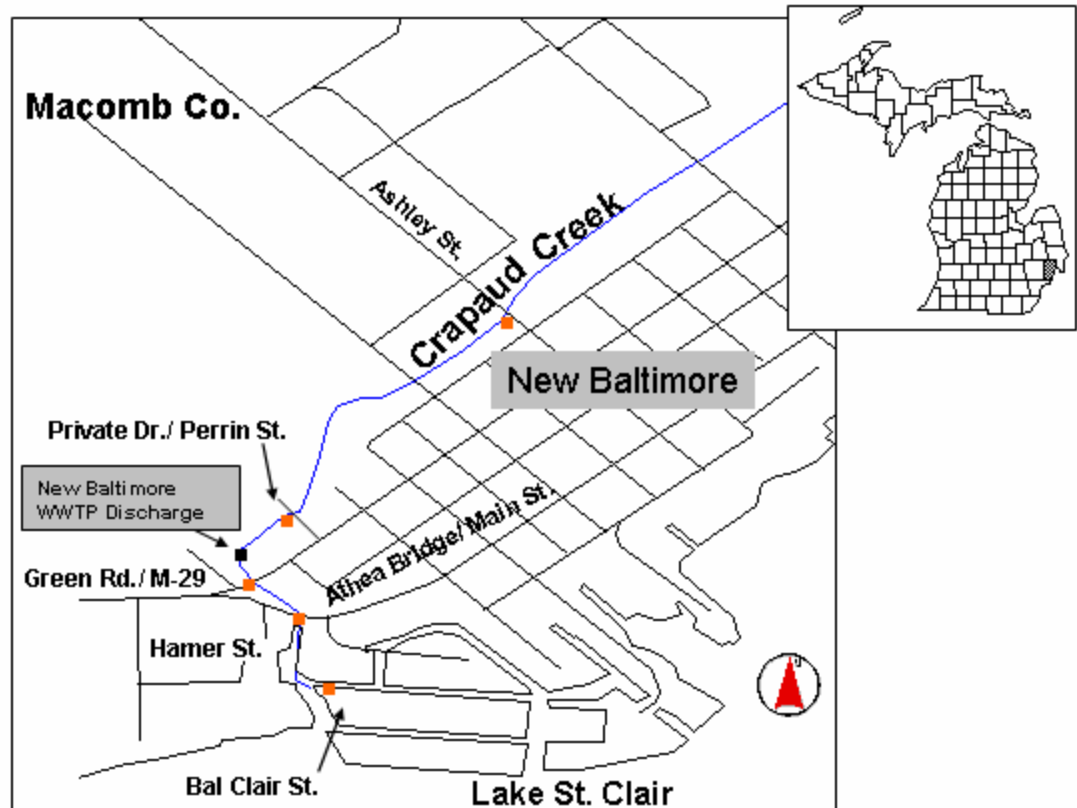


Figure 2. Crapaud Creek sampling locations for 2001 in the City of New Baltimore.

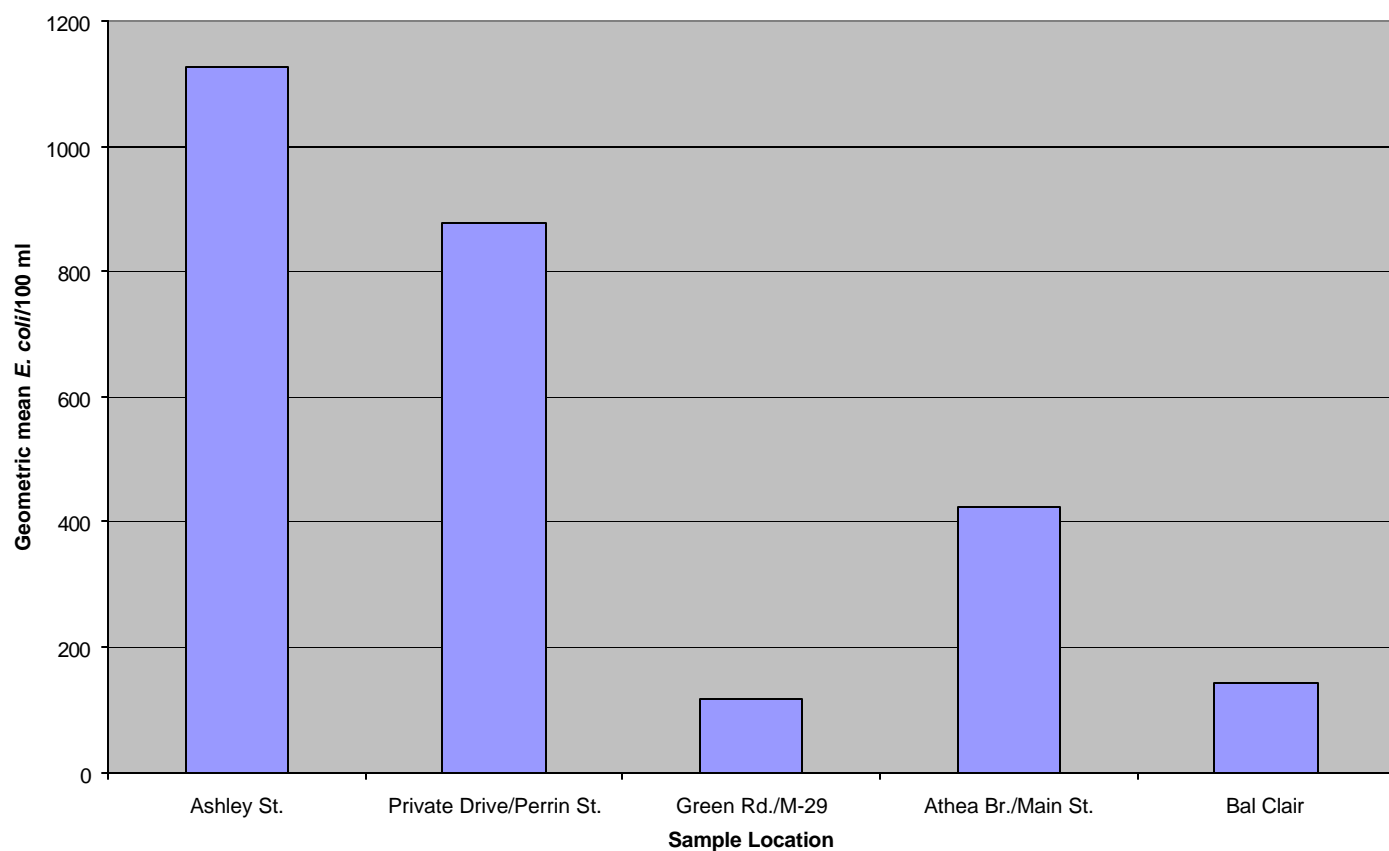


Figure 3. Mean *E. coli* results from Crapaud Creek, New Baltimore, Michigan, May through October, 2001. Data are presented upstream to downstream.

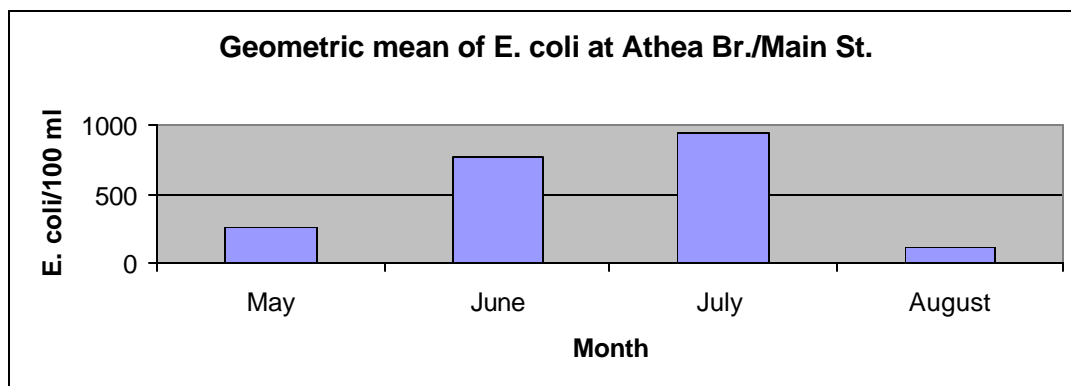
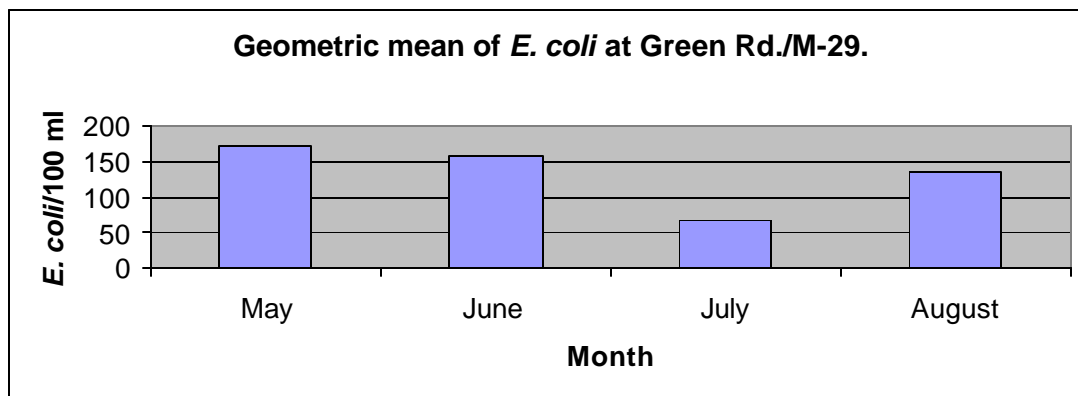
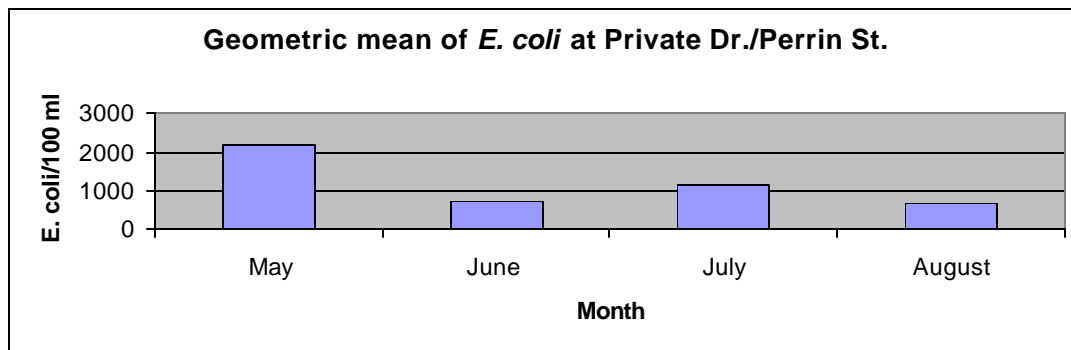
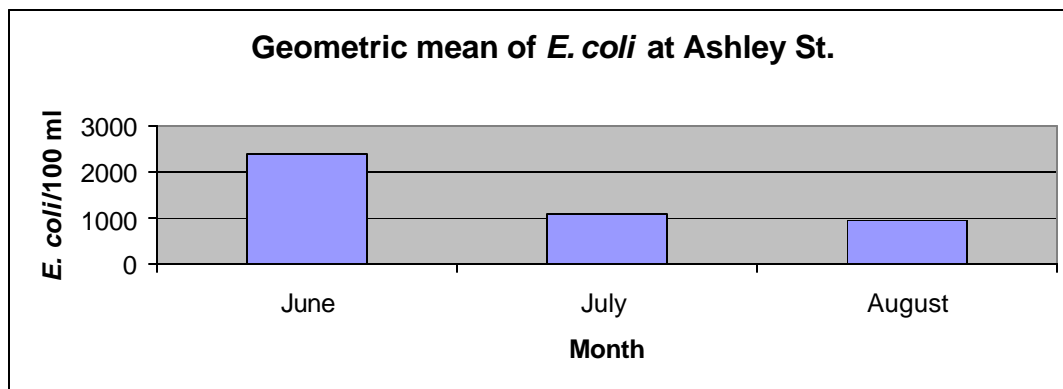


Figure 4. Geometric mean of *E. coli* at Crapaud Creek, New Baltimore, Michigan, 2001.

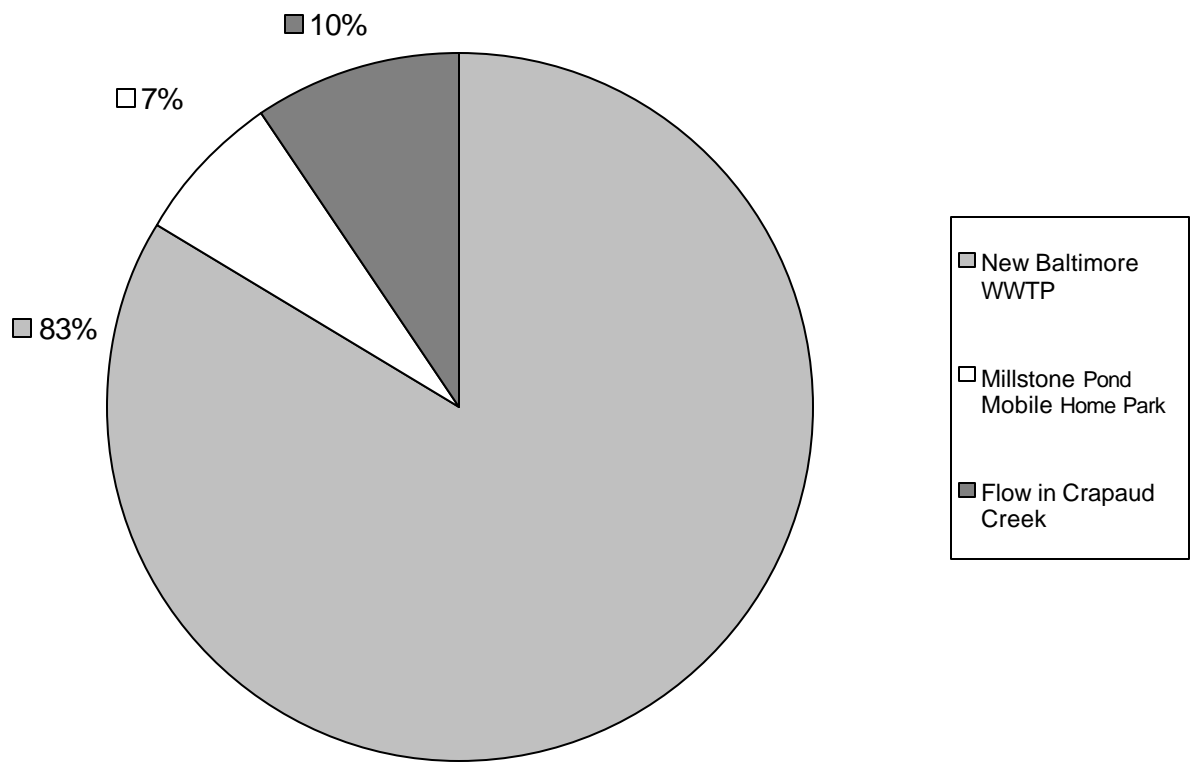


Figure 5. Percent Composition of Crapaud Creek flow at New Baltimore WWTP outfall location.

Appendix 1. MDEQ *E. coli* monitoring data for Crapaud Creek, New Baltimore, Michigan, for 2001.

Crapaud Creek @ Private Dr./Perrin St. CC-1 A	Crapaud Creek @ Green Rd./M-29 CC-2 A	Crapaud Creek Athea Br./Main St. CC-3 A	Crapaud Creek Bal Clair CC-4 A	Crapaud Creek @ Ashley St. CC-4 B
5/24/2001 2260 2200 2100	5/24/2001 230 170 130	5/24/2001 810 240 90	5/24/2001 90 120 120	6/26/2001 2400 2100 2800
6/5/2001 570 550 510	6/5/2001 170 80 250	6/5/2001 560 600 530	6/5/2001 90 100 50	7/3/2001 1830 1830 2180
6/12/2001 1200 1100 1400	6/12/2001 1000 10 40	6/12/2001 1200 1300 900	6/12/2001 140 150 230	7/11/2001 1100 700 610
6/19/2001 700 740 660	6/19/2001 1300 10 6900	6/19/2001 1100 660 970	6/19/2001 280 320 320	7/19/2001 1380 820 2000
6/26/2001 600 480 600	6/26/2001 80 130 200	6/26/2001 540 1200 380		7/25/2001 920 670 660
7/3/2001 1610 2090 1660	7/3/2001 280 360 860	7/3/2001 40000 80000 60000		8/1/2001 230 350 410
7/11/2001 420 620 880	7/11/2001 30 30 10	7/11/2001 280 210 290		8/8/2001 7000 7000 7000
7/19/2001 4700 4800 3400	7/19/2001 20 100 10	7/19/2001 270 130 170		8/15/2001 620 590 640
7/25/2001 370 440 470	7/25/2001 120 120 30	7/25/2001 190 570 240		8/22/2001 600 610 590
8/1/2001 570 1110 510	8/1/2001 150 130 120	8/1/2001 70 100 20		
8/8/2001 1400 1400 1400	8/8/2001 2100 2100 2100	8/8/2001 1900 1800 1900		
8/15/2001 450 400 430	8/15/2001 10 10 20	8/15/2001 10 10 30		
8/22/2001 450 420 430	8/22/2001 80 90 140	8/22/2001 130 190 110		

Appendix D: Project Team Members

Table 2-1: Anchor Bay Watershed Plan Administrative Committee

Organization	Representative(s)		
SCC Drain Commissioner's Office	Mr Fred Fuller, Drain Commissioner 21 Airport Drive St Clair MI 48079 810-364-5369 fuller@stclaircounty.org		
SCC Metropolitan Planning Commission	Mr Gordon Ruttan, Director 200 Grand River Ave, Suite 202 Port Huron MI 48060 810-989-6950 gruttan@stclaircounty.org	Mr Geoffrey Donaldson, Environmental Planner 200 Grand River Ave, Suite 202 Port Huron MI 48060 810-989-6950 gdonaldson@stclaircounty.org	
SCC Health Department	Mr Ron Miller, Director Environmental Health 3415 28th St Port Huron MI 48060 810-987-5306 rmiller@stclaircounty.org	Ms Kristen O'Reilly, Storm Water Coordinator Environmental Health 3415 28th St Port Huron MI 48060 810-987-5306 koreilly@hd.stclaircounty.org	
MC Public Works Office	Mr William Misterovich, Deputy Commissioner 115 S Groesbeck Hwy Mount Clemens MI 48043 586-469-5910	Ms Lynne Yustick, Environmental Engineer 115 S Groesbeck Hwy Mount Clemens MI 48046 586-469-5910 lynne.yustick@co.macomb.mi.us	Ms Lara Sucharski, Soil Erosion Supervisor 115 S Groesbeck Hwy Mount Clemens MI 48046 586-469-5910 lara.sucharski@co.macomb.mi.us
MC Health Department	Mr Thomas Kalkofen, Director 43525 Elizabeth Rd Mount Clemens MI 48043 586-569-5219 Tom.Kalkofen@co.macomb.mi.us	Ms Vicky Hartingh 43525 Elizabeth Rd Mount Clemens MI 48043 586-569-5219 Vicky.Hartingh@co.macomb.mi.us	Mr Gary White, Deputy Director Environmental Health Services 43525 Elizabeth Rd Mount Clemens MI 48043 586-469-5236 gary.white@co.macomb.mi.us
MC Dept. of Planning and Economic Development	Mr Steve Cassin 1 S Main Mount Clemens MI 48043 586-469-5285 stephen.cassin@co.macomb.mi.us	Mr John Crumm 1 S Main Mount Clemens MI 48043 586-469-5285 john.crumm@co.macomb.mi.us	

Table 2-2: Anchor Bay Watershed Project Steering Committee*

Organization	Representative(s)		
City of Algonac	Mr Paul Jarmolowicz, DPW Superintendent 805 St Clair River Dr Algonac MI 48001 810-794-5451 DPW@I-IS.COM	Mr Mike Harrington Johnson & Anderson 3910 Lapeer Rd Port Huron MI 48060 810-987-7820	
Casco Township	Ms Karen Holk, Supervisor 4512 Meldrum Rd Richmond MI 48064 586-727-7524 cascoctclair@yahoo.com	Mr Bill Ruemenapp 4512 Meldrum Rd Richmond MI 48064 586-727-8170	
Chesterfield Township	Mr Jim Ellis, Supervisor 47275 Sugarbush Rd Chesterfield Twp MI 48047 586-949-0400 salexie@chesterfieldtwp.org	Mr John McCleary, DPW Asst. Superintendent 47275 Sugarbush Rd Chesterfield Twp MI 48047 586-949-0400	
China Township	Ms Linda Schwehofer, Supervisor 4560 Indian Trail China Twp MI 48054 810-765-1145 chinatownship.supervisor@co mcast.net	Mr Ron Beier, Trustee 4560 Indian Trail China Twp MI 48054 810-765-1145	
Clay Township	Mr Joseph McKoan, Supervisor 4710 Pte Tremble Algonac MI 48001 claytownship.org 810-794-9303	Ms Connie Turner, Treasurer 4710 Pte Tremble Algonac MI 48001 claytownship.org 810-794-9303	Mr Mike Kras, Building Official 4710 Pte Tremble Algonac MI 48001 claytownship.org 810-794-9320
Clinton Township	Mr Robert Cannon, Supervisor 40700 Romeo Plank Clinton Twp, MI 48047 586-286-8000	Ms Mary Bednar, Engineer 40700 Romeo Plank Clinton Twp, MI 48047 586-286-9387 mbednar@clintontownship.com	
Cottrellville Township	Mr Bill Zweng, Supervisor 7008 Marsh Rd Marine City MI 48039 810-765-4730	Ms Violet Pfaff, Clerk 7008 Marsh Rd Marine City MI 48039 810-765-4730	
Harrison Township	Mr Mark Knowles, Supervisor 38151 L'Anse Creuse Harrison Twp, MI 48045 586-466-1406	Ms Joy Vallier, Deputy Supervisor 38151 L'Anse Creuse Harrison Twp, MI 48045 586-466-1406	
Ira Township	Mr John Jones** Supervisor 7085 Meldrum Rd Fair Haven MI 48023 586-725-0263 iratwp@usol.com	Mr Martin Barnes, DPW Superintendent 7085 Meldrum Rd Fair Haven MI 48023 586-725-0263 iratwp@usol.com	
Lenox Township	Mr John Gardner, Supervisor 63975 Gratiot Lenox, MI 48050 586-727-2085	Mr Mack Weaver, Trustee 63975 Gratiot Lenox, MI 48050 586-727-2085	Mr Cam Trombly 59950 Gratiot Lenox MI 48048 586-749-0230
Macomb Township	Mr David Koss, Water & Sewer Superintendent 51650 Card Rd Macomb MI 48042 586-598-0687	Mr Jack Dailey 51650 Card Rd Macomb MI 48042 586-598-0687	

Table 2-2: Anchor Bay Watershed Project Steering Committee* (continued)

Organization	Representative(s)		
City of Marine City	Mr Michael Nagy, City Manager 300 Broadway Marine City MI 48039 810-765-9011	Mr Rick Ames, DPW Superintendent 300 Broadway Marine City MI 48039 810-765-9711	Mr Bill Klassen 300 Broadway Marine City MI 48039 810-765-9011
City of Mount Clemens	Mr Harry T. Diehl, Major One Crocker Boulevard Mount Clemens, MI 48043 586-469-6803	Mr Chuck Bellmore, Utilities Supervisor One Crocker Boulevard Mount Clemens, MI 48043 586-469-6889	
City of New Baltimore	Mr Joe Grajek*** Mayor 36535 Green St New Baltimore MI 48047 586-725-2151		
Village of New Haven	Ms Deborah Mack, President 58725 Havenridge New Haven MI 48048 586-749-5301 villagenh@i-is.com	Mr Robert Chreighton, DPW Director 58725 Havenridge New Haven MI 48048 586-749-5301	
City of Richmond	Ms Jan Hunt, Mayor 68225 Main St. Richmond, MI 48062 586-727-7571		
Richmond Township	Mr. Gordon Fuerstenau, Supervisor 34900 School Section Rd Richmond MI 48062 586-727-8998	Ms Cindi Greenia 34900 School Section Rd Richmond, MI 48062 586-727-8998	

*Members of the Administrative Committee also serve on the Steering Committee.

**Mr. Jones serves as the Chair of the Steering Committee.

***Mr. Grajek serves as the Vice Chair of the Steering Committee.

Table 2-3: Anchor Bay Watershed Project Technical Committee

Organization	Representative
SCC Health Department	Ms Kristen O'Reilly, Storm Water Coordinator Environmental Health 3415 28th St Port Huron MI 48060 810-987-5306 koreilly@stclaircounty.org
SCC Metropolitan Planning Commission	Mr Geoffrey Donaldson, Environmental Planner 200 Grand River Ave; Suite 202 Port Huron MI 48060 810-989-6950 gdonaldson@stclaircounty.org
MC Public Works Office	Ms Lynne Yustick, Engineer 115 S Groesbeck Hwy Mount Clemens MI 48046 586-469-5910 lynne.yustick@co.macomb.mi.us
MC Dept. of Planning and Economic Development	Mr Gerard Santoro, Senior Planner 1 S Main Mount Clemens MI 48043 586-469-5285 gerard.santoro@co.macomb.mi.us
Village of New Haven	Mr Jeff Bednar, Engineer Anderson, Eckstein & Westrick, Inc 51301 Schoenherr Shelby Twp MI 48315 586-726-1234 jbednar@aewinc.com
Chesterfield Township, Clay Township, Harrison Township, Ira Township, Mount Clemens, New Baltimore, and Richmond Township	Mr Chris McLeod, Planner Community Planning & Management, 48970 Schoenherr Rd. Shelby Township MI 48315 586-247-7500 cpm@eaglequest.com
SEMCOG	Ms Amy Mangus, Senior Planner 535 Griswold Street, Suite 300 Detroit, MI 48226-3602 313-324-3350 mangus@semcog.org

**Appendix E:
Public Involvement Survey**



ANCHOR BAY WATERSHED SURVEY OF INTERESTS AND CONCERNS

Thank you for your interest in the Anchor Bay Watershed. **Your input is vital** to the development of action plans by the public agencies responsible for management of the watershed. Your survey response will help Anchor Bay watershed communities determine where priorities should be placed in their efforts to improve our water quality. Please take the time to mail or fax this survey back to us. Fax and address information is on the back page of this survey.

Help us prioritize improvements in Anchor Bay water quality.

Rank the following goals with a score of 1 to 5, with 1 being most important and 5 being the least important.

- ☐ Remove paper, trash and debris in the Bay and its tributaries to improve its appearance
- ☐ Better control soil erosion and limit sediments entering the water
- ☐ Improve habitat conditions for fish and wildlife in the water
- ☐ Minimize excessive flows that cause flooding, bank erosion and habitat loss
- ☐ Encourage investments in land along water for recreation/wildlife protection
- ☐ Expand public education about the benefits of protecting Anchor Bay
- ☐ Better control sources of fertilizer reaching Anchor Bay and the Great Lakes
- ☐ Remove sources of human waste in Anchor Bay that threaten public health
- ☐ Increase community planning to address development and protection of water quality

Are there any other goals that you feel should be included in this list? Please indicate any additional goals you would like to see added. How would you rank them from 1 (most important) to 5 (least important).

☐

☐

What issues concerning the management of Anchor Bay are most important to you?

What is the single most important improvement to Anchor Bay and its tributaries that you would like to see?

What types of information about the Anchor Bay Watershed interest you most? (Check as many as apply)

Water Quality ____ Bacteria levels ____
Parks and Public Recreation Areas ____ Fish and wildlife ____
How homeowners can help prevent pollution ____ How businesses can prevent pollution ____
How I can volunteer to help restore Anchor Bay ____ Other (Specify) _____

Which of the following is the best approach to keep you informed regarding the progress in developing a plan to restore Anchor Bay?

Public meetings/workshops ____ Newspaper articles ____ Cable television ____
Web page ____ Direct mailings to your home or business ____ Community newsletters ____
Other (Specify) _____

The following information is requested so that we can keep you informed on the progress of the Anchor Bay watershed planning effort. We will send you information regarding the Anchor Bay Watershed Plan and opportunities to learn more about this project. There is an Anchor Bay public meeting in the fall of 2002, where presentations will be made and public input will be encouraged.

Name _____ Address _____

Phone _____ E-mail _____

Mail or fax survey to:

Geoffrey Donaldson
St. Clair County Metropolitan Planning Commission
200 Grand River, Suite 202
Port Huron, MI 48060
Fax: (810) 987-5931

Appendix F: Community Surveys

City of Algonac
Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	Not a combined system, televising (1999) – only SSO would be a break in the line
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County			X	Small portion of septic – Dana Drain area of Clay Twp, which was recently annexed by the City, had 3 OSDS sites all of which are being supplied with water and sewer service.
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				County program, IDEP grant. City also checks outfalls as part of their routine programs.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b				X	Only 3, being hooked up to sanitary
23	Install/Maintain Oil and Grease Trap Devices	2a					
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					Incidental program of visual observations & budget review
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b	X				Doggie disposal dispensers at parks for dog waste. Pet ordinance limits the number of animals but does not address manure or pet waste disposal.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c	X				Hazmat/Fire department – containment booms. No catch basin stenciling. Most runoff is into ditches/swales.
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b				X	County run wastewater treatment plant, City is totally sewered. No master plan

**City of Algonac
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County program. City has ordinance that requires developer to obtain a County SESC permit prior to obtaining a building permit.
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b	X				Rip-rap on the boat launch – as needed maintenance. Check City areas on an ongoing basis
24	Install/Maintain Sediment Control Devices	2a, 2b	X				Subdivisions need to install detention/retention ponds by ordinance. Approval requires county permits also.
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	County				

**City of Algonac
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c					County program, participate with Clay Township program. City publicizes dates on website and cable TV station.
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Curbside recycling and composting. Fall leaf pickup available to residents.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					Ongoing, informal training
22	Increase Public Awareness	All	X				Anchor Bay survey on website (www.cityofalgonac.com), cable channel, (Rose Perricone), River Day Event. Brochure location at city building – Downriver recreation commission D.R.C. (Cindy Babicz)
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a		X			Have talked about an ordinance. Contractor handles City property.
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d		X			Garden clubs. Will put brochures in City Hall.

City of Algonac
Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d					Retention ponds – requirement by county.
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b	X				Clean the ones on the city portion of the system – DPW does this manually twice per year. MDOT does the M-29 catch basins.
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Required by ordinance. Most of the system is swales and ditches.
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Televised the sewers in 1999 and are now fixing problems. 5 year program to correct I/I – spent \$300,000 to date with an estimated \$600,000 remaining.
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d				X	No lagoons – SCCDO would control
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X	X			Smoke test / dye test – not routinely but will investigate if a problem is suspected. A fertilizer/herbicide program in a short term goal.
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c	X				SCCDO & MDOT mainly. DPW performs maintenance for the few catch basins in the City system.
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				Yes, use bush – mostly done on M-29. County does sweeping 4 times a year; city sweeps 2 times per month.
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Part of Engineering Standards Ordinance.

**City of Algonac
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b				X	Completely paved so doesn't really apply.
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d				X	No plans – everything that could be conserved by city already is
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Parks available & advertised. Recreational master plan completed. Received CMI grants for tot lots.
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b					
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X				Addressed in the site plan review master plan mentions natural feature protection.
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d				X	Part of drain easement, City does not handle.
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d				X	Privately owned property
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					Not really able to do this
46	Utilize Habitat Restoration Techniques	2a				X	County drains

City of Algonac
Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b				X	No agriculture
14	Implement Financial Solutions	All	X				Money for sanitary maintenance. Always looking into grants (CMI)
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Part of watershed groups
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d	X	X			Have ordinance in place, but needs to be updated (short-term)
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Ordinance officer; daily inspections; complaint responses.

Community Name:	City of Algonac	July 23, 2003
Community Representatives:	Paul Jarmolowicz, Kris Goetze, Mike Harrington & Jeff Hansen	

**Casco Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	Trailer park has a sewer system, not under twp. Jurisdiction
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				County IDEP. There were 24 failed sites in the investigated Twp. area.
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				County, Twp will pass along complaints. Recent IDEP survey showed 7 unknown/detergent type discharge sites.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b		X			Website will contain information link to SCHD MSU Extension
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Zoning ordinance – gas station, repair shops are required to install separator/trap devices. Any commercial/industrial facility using oil & grease are required to install.
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					Contract out snow removal at Twp facilities. County does removal on paved roads and MDOT maintains I-94.
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					Township ordinance limits the number of animals but does not address pet waste.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c				X	No storm sewers
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b					Township is too far from WWTP to provide sewers.

**Casco Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County requires soil erosion permits
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b				X	
24	Install/Maintain Sediment Control Devices	2a, 2b				X	Rock dams put in by county – township pays the county
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	County				County SCCDO

**Casco Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	County				County runs the program but the Twp notifies residents through cable channel, brochures, and websites.
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a					Residential pickup is handled by independent waste haulers, recycling on their own. Composting facility in the Twp will accept leaves, grass and garden material. Currently exploring options of township-wide contract for household waste pick up. Working on an ordinance need public hearing.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c				X	
22	Increase Public Awareness	All	X				Website, links to MSU Extension – SCCHD – etc. Newspaper special mailings, cable access, brochures/flyer at Twp. offices
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				Do not use on Twp property
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d	X				A link to the MSU Extension office will be placed on the Twp website

**Casco Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Retention ponds required by zoning ordinance and as part of site plan review for commercial and industrial sites.
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b				X	
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	County				The Township requires specific run off rates by ordinance. Also must meet County standards.
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b				X	
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d					
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Inside sprayed by Terminix monthly. Township hall is the only public facility. Pump and haul system for the toilets – pumped monthly
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c				X	County cleans ditches. Twp pays for ditching on local roads.
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b				X	County, calcium chloride on unpaved roads at Twp expense.
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Have PUD ordinance.

**Casco Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b	X				Master Plan contains NFI and it is currently being updated.
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d					Privately owned land
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d				X	None.
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Have a Recreational Master Plan. Twp has a 97-acre parcel for park development through a CMI grant.
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b					None
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X				Master plan, soil removal ordinance open space – cluster housing (2.5 developed/2.5 open forever)
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d				X	
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				White Oaks Conservancy
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					None
46	Utilize Habitat Restoration Techniques	2a					None

**Casco Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b					Supports the use of GAAMPs within the Twp.
14	Implement Financial Solutions	All		X			Always searching for applicable grants (i.e. park development)
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Participate in Anchor Bay Watershed Groups
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Violation of County regulations is directed to proper channels. The Twp enforces their ordinances directly.

Community Name:	Casco Township	July 24, 2003
Community Representatives:	Karen Holk and Bill Ruemenapp	

**Chesterfield Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				County IDEP program, Twp c checks complaints before they refer.
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				County IDEP program, Twp checks complaints before they refer.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b					Refer any questions to County.
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Sand traps and/or oil traps for everything except residential
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a	X				Physical removal and salt of necessary. Only salt where there are problems
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b	X				Pets not allowed in park. Limited agricultural area in the Twp.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c	X				Catch basin stenciling. Require a secondary containment at storage facilities.
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X				Sewer Master Plan

**Chesterfield Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County program; check complaints then refer to County; Joe is certified under storm H ₂ O operator program. Need permit prior to issuing building permit
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b					Twp does not have jurisdiction over any open water courses.
24	Install/Maintain Sediment Control Devices	2a, 2b	X				For Twp projects
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d					Refer flow obstructions to county.

**Chesterfield Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c					Work of County Health Department; Maintain a list of locations for oil disposal in the Twp.
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a					Individual contractors. Ordinance that homeowners need to have recycle program
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					Encourage people to attend classes and seminars but not formal program
22	Increase Public Awareness	All	X				Website (www.chesterfieldtwp.org); Consumer Confidence Report for water; cable channel (community access); Newsletter (starting)
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				Do their own – couple employees have application licenses Fertilize on an as needed basis
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d	X				Use MSU Extension brochures

**Chesterfield Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Require detention for 2" rain over site. Require S.A.D. agreement that allows Twp to do maintenance if necessary
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b					
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				TV, cleaning, & repairs. Entire system is inspected over a 5 year period. Manhole inspection. Weekly lift station inspection
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d	X				Catch basin restrictions; restricted outlets
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c					
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				Respond to complaints. County routinely does roads
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				PUD with cluster option. Preservation of natural features as a priority

**Chesterfield Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b		County			County Michigan Natural Features Inventory and updated wetlands survey available November 2003
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d					
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d	X				25 mile & Fish Creek I-94 MHP MDEQ mitigation that was then turned back to Twp
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Recreational Master Plan that includes environmental protection areas
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b					
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d		X			
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				Tree restoration ordinance
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					
46	Utilize Habitat Restoration Techniques	2a		X			

**Chesterfield Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b					
14	Implement Financial Solutions	All	X				Grant writer. Tap in fee for storm sewers. Can establish SAD for storm H ₂ O.
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Actively participating in Watershed Groups
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Code enforcement officer

Community Name:	Chesterfield Township	August 14, 2003
Community Representatives:	Jim Ellis, Joe Gayeski, John McCleary, Eric Wurmlinger, Janice Giese	

**China Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	No sanitary sewer overflows
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				County IDEP Program
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				County IDEP Program
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b		X			Information link on website
23	Install/Maintain Oil and Grease Trap Devices	2a				X	No commercial facilities
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	China & East China share a wastewater plant
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a				X	Road commission salts roads, the community doesn't salt parking lot
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					Ordinance – minimum 5 acres for farm animals. However it does not include requirements for controlling manure impacts or pet waste.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c				X	
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b		X			Master plan being developed that includes sewer service area. Anchor Bay portion is not included in service area, so they will rely on septs.

**China Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County programs – Twp. requires builder to get county permit as part of the building packet.
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b				X	No open surface H ₂ O
24	Install/Maintain Sediment Control Devices	2a, 2b	County				
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	County				SCCDO, SSRC

**China Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	County				Refer questions to the county. Flyers available at Twp. Offices
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Trash and recycling through Township-wide waste contractor. Recycling bins available to residents and also located at Twp. Office. No compost program but individual composting is supported/encouraged.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					
22	Increase Public Awareness	All	X				Website (www.chinatownship.net), special mailings, brochures/mailings available at Twp. Office
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a					Use contractor to mow soccer field and local farmers apply fertilizer as necessary.
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d		X			Flyers or post on website

**China Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d					
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b				X	
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b				X	In Anchor Bay
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d				X	In Anchor Bay
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d				X	In Anchor Bay
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c				X	
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b				X	
40	Reduce Directly Connected Impervious Surfaces	4c, 4d					

**China Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b					
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d					Small portion of land owned by Twp, no current development plans.
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d					
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b					
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d					
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					Beaubien Creek in Anchor Bay, Twp paid to get it cleaned through the county maintenance program
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d					
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					
46	Utilize Habitat Restoration Techniques	2a					

**China Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b	State				Right to farm – State
14	Implement Financial Solutions	All					No plans, always interested
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Anchor Bay Watershed Planning
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Ordinance enforcement officer

Community Name:	China Township	July 25, 2003
Community Representatives:	Linda Schwehofer, Leona Markel, Brian Slizewski	

**Clay Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c	County				County IDEP.
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				County HD IDEP. 12 failed OSDSs and 1 laundry discharge identified.
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	X				Building and Zoning Department in Twp looks for illicit discharges as a part of routine business.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b	County				MSU Extension/SCHD septic systems maintenance brochure are provided at Twp offices and residents are referred to SCHD.
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Required by Twp ordinance – DPW & fire department have at their sites. Also required of commercial facilities.
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a	X				County RC salts the roads. Sodium deicer – pellets; cost more but cleaner
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b	X				Garbage ordinance – not to be included in household trash. Zoning ordinance states where you can put manure. Ordinance also restricts number of animals per household/acre (Dogs = 4 Horses = 1 per acre)
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c	X				Hazmat certified personnel with fire department – containment materials are available for use on sanitary sewers. No storm sewers. Short term: Hazardous clean up ordinance being reviewed
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X				Master Plan has land use areas designated. Twp has done sanitary sewer potential growth study. Grey water ordinance in place including that sinks in boat houses & garages must connect to sanitary.

**Clay Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County program. Twp refers complaints to SCCRC
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b					County soil erosion permits. Before issued a building permit, builder must provide a copy of the County permit.
21	Implement Streambank Stabilization Measures	2a, 2b				x	Diking program in St. John's Marsh as part of Supplemental Environmental Program (SEP) with Ducks Unlimited, Water Fowlers and other WWTP partners
24	Install/Maintain Sediment Control Devices	2a, 2b				x	Work closely with Health Department
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d				x	St. Clair County Drain Office. Complaints directed to the Drain office

**Clay Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	X				DPW – collects motor oil. Direct residents to Bud's Auto Mortuary for antifreeze and motor oil. Twp hosts a collection day with St. Clair County Board of Commissioners at Fire Dept. Twp also takes propane tanks and batteries.
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				One major appliance pick up per week. Curbside recycling is available through hauler on an individual basis. Yard waste pickup is also available. Free drop off. Harsens Island – remote recycle option
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					
22	Increase Public Awareness	All	X				Website, newsletters, newspapers, cable channel twice a day / two days per week – board meetings
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a		X			Do not currently use materials at their facilities. Will use environmental friendly methods as necessary.
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d	X				MSU Extension link on website. ABC Bees contracted, use a less intrusive spraying method.

Clay Township Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Site plans require retention ponds (planning community). Put in place by policy and ordinance.
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b				X	SCCRC county program
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Bioretention areas – greenbelts in zoning ordinance, new construction requires minimum pervious landscape %
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Routine smoke testing, dye testing as necessary; gaskets on the lids of the sewers. Clay & Ira Twp and City of Algonac are partners in the St. Clair County WWTP. Clay Twp maintains internal lift stations & collection sewers. Twp owns 35 % share of WWTP.
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d				X	
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Check the public facilities regularly
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c				X	SCCDO
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b				X	SCCRC
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Retention ponds, LID – PUDs, open space subdivisions, county road ordinance – new construction to county specs (no private roads)

**Clay Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b					
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d					
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Bike path in the works on Harsens Island. Twp is very recreation focused
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b					
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X				Master plan covers this
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d				X	No Twp controlled riparian corridors
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				Marsh clean up (15 yrs now) Mike coordinates this. Twp philosophy is conservation of natural resources.
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					
46	Utilize Habitat Restoration Techniques	2a				X	

**Clay Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b					Not much agriculture in Twp
14	Implement Financial Solutions	All					
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Present at Anchor Bay Watershed meetings
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				

Community Name:	Clay Township	July 22, 2003
Community Representatives:	Michael Pellerito, Connie Turner, Michael Kras	

**Clinton Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	Have identified and currently working on implementing controls. ACO with State that requires footing drain disconnect project.
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b		X			\$50,000 CMI grant for IDEP. Working with MCHD in 2 ½ sections – using money at hot spots.
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c		X			Have only found septic problems, but eliminating septs where they can.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b	County				Will work with County. Eliminating OSDSs through sewer extension program.
23	Install/Maintain Oil and Grease Trap Devices	2a	X				New commercial/light industrial developments are required to install stormceptor type devices.
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a	County	X			Public education program MDOT training videos (part of Phase II good housekeeping). MCRC does roads in the Twp. Have changed over to calcium chloride flakes on Twp. property.
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					No farm land. Have park in CREW area that requires cleanup after pets, but no township-wide ordinance.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c	X				See 13 & 23 above.
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X				Sanitary Sewer Master Plan for sewer locations within the Twp.

**Clinton Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				Local plan review process requires a copy of the County permit prior to obtaining a building permit.
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b				X in Anchor Bay	Leave the banks natural in a vegetative state.
24	Install/Maintain Sediment Control Devices	2a, 2b					
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	X			X in Anchor Bay	Twp. removes log jams and debris in natural watercourse areas.

**Clinton Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	X				Published County materials available at the DPW office and on the Township TV station. Township DPW will but batteries, antifreeze and other household hazardous materials go to the County DPW or HD.
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Curbside recycling thru municipal waste hauler. Litter clean up weekly on maintained areas and 4 times annually on Gratiot.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c	X				2 hr. orientation / union 2 hrs. general information & importance of environmental safety
22	Increase Public Awareness	All	X				Township T.V. station, website (www.clintontownship.com), published materials & brochures
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				Reduction through Integrated Pest Management (IPM) for the last three years. Twp. personnel have applicator certification. Messages to residents thru Township T.V. station and Macomb County Programs.
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d	X				IPM, Township T.V. station, brochures, articles in newsletter and special mailings.

**Clinton Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Required as part of ordinance. Twp. currently owns and operates one detention facility and looking at acquiring another one.
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b	X				Clean catch basins and sewer system every 3-5 years. Also have a regular program to TV & clean system.
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d		X			Stormceptors or similar devices required in the industrial section
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Ongoing
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d	X				Ongoing. Stormceptors. Detention/retention pond covenants for maintenance at new development and redevelopment. If facility does not maintain then the Twp. will maintain and assess the facility.
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				IPM & salt control.
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c	X				Do this on a regular basis, get back to them every 3-5 years
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				Purchased a street sweeper with dust control – Township does subdivisions county does other
40	Reduce Directly Connected Impervious Surfaces	4c, 4d		X			Low impact ordinance, 95% developed

**Clinton Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b			X		Applied for wetlands inventory grant in progress not specifically in Anchor Bay. County also doing a Natural Feature Inventory that will be available to the Twp.
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d	X				Lots of parks, township has an ongoing program to acquire riparian land, as well as land for open space and parks.
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d				X	Not applicable in the small area tributary to Anchor Bay.
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Joy Park, always looking at other prospective areas.
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b			X		Township wide ordinance
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d			X		
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d				X in Anchor Bay	Not in Anchor Bay, but as a Township they are managing riparian corridors.
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				Joy Park
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d	X				
46	Utilize Habitat Restoration Techniques	2a	X				Working on implementing some of technologies

**Clinton Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b				X	No farm land, do have a horse farm
14	Implement Financial Solutions	All	X				Waiting for wetlands inventory grant. Storm drainage development fee based on impervious surfaces. If never assessed, upon new construction /development. If never paid, then they must pay on all paved surfaces/hard area. Emergency Drain Funds through MCPWO, Army Corp grant for Watershed Management Plan in other subwatersheds.
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Work with watershed group
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d		X			Working on new ordinances. Planning on coordinating with other watershed communities.
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	x				Currently monitoring water quality. IDEP program in other subwatershed, eventually will be doing township wide.
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d		X			Looking into training individuals to work with the county on SESC measures (MC Office of Public Works). Have sufficient resources currently to enforce currents and short term ordinance proposals.

Community Name:	Clinton Twp.	July 21, 2003
Community Representatives:	Carlo Santia, George Westerman, Mary Bednar, Eric Jackson	

**Cottrellville Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs) Smoked: 1992	1a, 1b, 2a, 3a, 3b, 3c				X	
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				County IDEP program. Take calls from residents, investigate and refer to county
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				County IDEP program. Take calls from residents and conduct a complaint investigation
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b		X			Referred questions to the SCHD. Will take brochures from the health department and make them available at the Twp. Office.
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Commercial businesses, part of site plan review.
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a	X				Roads salted by county road commission. Use urea as a salt substitute on bike path, and parking lots.
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b		X			Proposed bike path & park ordinances will deal with animal waste. Zoning ordinance limits# of animals/residence
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c				X	
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b					

**Cottrellville Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				Taken care of by the county. Twp. requires copy of county permit prior to issuing the building permit.
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b					
24	Install/Maintain Sediment Control Devices	2a, 2b					
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	County				Twp. investigates complaints and refers them to the county as appropriate.

**Cottrellville Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	X				Pamphlets, the voice (newsletter), let residents know about the Clay Twp program and where to dispose/take household hazardous materials.
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Litter portion of the park and bike path ordinances. Garbage and recycle program for all residence – compost is available for a fee through the twp service provider
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c	X				Send employees to training for licenses, conferences, and seminars.
22	Increase Public Awareness	All	X				Website (www.cott_township.org), newsletter (x2/year), special mailings, pamphlets @ twp. office, channel 6-marine city station
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				None used on Twp. site.
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d		X			Will put info on website, newsletter or hand out brochure (short-term)

**Cottrellville Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d					
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b				X	No catch basins or storm sewers in the Twp.
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				1992 smoke test. Ongoing manhole maintenance program. DPW checks pump stations weekly and has a preventative maintenance program. Sewered area along M-29 from Marine City to Algonac State Park.
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d				X	No detention ponds
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c				X	
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b				X	MDOT, county maintenance.
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Open space preservation ordinance

**Cottrellville Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b					
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d	X				Look at property as it comes up for sale for possible land acquisition. Have a Recreational Master Plan.
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Recreational Master Plan. Cottrellville Twp. Park currently under development.
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b					
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d					
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					Easement, resident controlled and maintained
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d					Ordinance requires 25% of lot to remain as pervious surface.
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					
46	Utilize Habitat Restoration Techniques	2a					No, county does maintenance

**Cottrellville Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b					
14	Implement Financial Solutions	All					
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Yes, actively participates in Watershed-wide activities
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Township Building Official and Twp. Building Inspector.

Community Name:	Cottrellville Township	August 5, 2003
Community Representatives:	Bill Zweng, Renn Mazey, Betty Zweng	

Harrison Township Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	X				County IDEP. Elimination of failed systems part of CMI grant program that township has. All OSDSs will be eliminated over the next 5 years
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c		X			Phase II
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b					Brochures available
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Ordinance – Engineering
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b	X				Nuisance Ordinance requires people to clean up after their pets
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c		X			Phase II
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X				Sewer Master Plan

**Harrison Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County Program – require copy of permit before building permit is issued (by ordinance)
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b					
24	Install/Maintain Sediment Control Devices	2a, 2b	X				Maintenance agreements are part of site plan review – ordinance
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	X				Township routinely removes obstructions from county drains

**Harrison Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	County				Through county
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a					Trash removal individually contracted by homeowner
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c		X			Phase II
22	Increase Public Awareness	All	X				Cable TV channels; Twp currently working on website; Brochures/pamphlets available
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				Contract – use environmentally friendly materials
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d		X			Phase II – will develop link on new website

**Harrison Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Required by Ordinance
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b					Have equipment available but currently not doing. Most of catch basins are in county jurisdiction
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Considered as part of engineering /site plan review for new projects
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				TV inspection; preventative maintenance on collection system & pump station; annual manhole rehab programs
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d	X				Maintenance agreements required by ordinance
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c					
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b					County has jurisdiction
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Zoning ordinance

**Harrison Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b		X			Currently being developed (wetlands committee) have grant through MDEQ . Also, County Michigan Natural Features Inventory and updated wetlands survey available November 2003
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d	X				Have program to acquire property – Wooded track between Metropolitan Parkway and Jefferson (±100 acres)
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Recreational Master Plan
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b		X			Working on wetlands ordinance
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X				
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				Engineering standards ordinance and zoning ordinance
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					No.
46	Utilize Habitat Restoration Techniques	2a					

Harrison Township Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b				X	No agricultural area in township
14	Implement Financial Solutions	All		X			Developing storm water utility and DPW; grant applications
15	Implement Institutional Framework for Watershed-wide Actions	All	X				C.R.E.W.; Anchor Bay
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					Possibly addressed under new wetlands or storm H ₂ O utility ordinances
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Code enforcement office building office er. Emergency and Utilities Director

Community Name:	Harrison Township	August 27, 2003
Community Representatives:	Randy McCannell	

**Ira Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				County IDEP, helps county correct (6)
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				Phone # and newsletter DPW keeps their eyes and nose open while doing water tap refer to SCHD and/or county. Respond to resident complaints – check to see if it needs to be referred.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b	X				Brochures out front – public education. Also refer them to SCHD
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Required by building code <u>BOCA</u> . DPW maintains the devices on their own facilities.
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a	X				Majority done by county and MDOT – plow/manual removal, then salt
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					Minimum lot size for livestock. Limit number of animals at an individual residence. Nothing done about manure handling
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c					Sump in parking lot catch basin in Twp offices.
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X	X			Drafting ordinance to regulate placement of lagoons & WWTPs. Currently have sewer allocation policy and minimum required lot size for OSDS. Have water/sewer master plan.

**Ira Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County program but Twp requires evidence of permit under site review process. Twp has 3 people certified under SESC program. Twp uses BMPs on all their projects.
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b	X				SCCDO did the stream stabilization project in the Twp. Stabilization is required as part of their own projects.
24	Install/Maintain Sediment Control Devices	2a, 2b	X				Check dams, rock dams, silt fences – seed and mulch afterwards
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	County				SCCDO. Twp will let them know of resident complaints

**Ira Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	County				Documents at the township office – provide county information. Provide info on Clay Township pickup
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Curbside resident recycling program through waste contractor. Yard waste compost available.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c	X				Soil erosion certification training (optional)
22	Increase Public Awareness	All	X				Newsletter (2xs/year), brochures in township offices, Consumer Confidence Report.
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				Newsletter highlights fertilizer use. Little to none used by the Twp.
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d	X				Newsletter focus, SCHD brochure

**Ira Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Shared authority over storm water storage, Enforcement authority to require maintenance authority. Required by ordinance for certain types of development, Twp can establish special assessment district for fees
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b				X	Only storm sewer is at the municipal/Twp complex
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Smoke test as needed. Daily pump station inspection. Check joints, etc. to make sure system is sound. Have an ongoing I/I program.
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d				X	
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Check building to make sure they aren't illicitly connected. Downspout discharge to grassy area. Minimize use of fertilizers, pesticides and herbicides.
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c					County, SCCDO
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b				X	None done, county does intersection not to many curbs
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Twp recently adopted an open space ordinance

**Ira Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b					DNR assessment of the twp property for woodlands and wetlands but not Twp wide. Master Plan covers wetlands/woodlands.
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d	X				None vacant along the Bay – very little available – always looking along inland areas. Swan Creek corridor. Twp checks any available property to see if it fits with their long range plans.
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Always looking – new park, fishing area along Swan Creek last year. Parks and Recreation looking to add a kids area through grant (Ira Twp Waterworks Neighborhood Park)
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b	X				MDEQ verification of wetlands. Woodlands ordinance requires replacement of a % of trees removed.
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X				Master plan; woodland ordinance, wetland verification, greenscape; open space ordinance; development ordinance
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				Woodlands ordinance allows building; but they must replace a percentage (up to 10 – 25%)
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					No
46	Utilize Habitat Restoration Techniques	2a					

**Ira Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b					
14	Implement Financial Solutions	All	X				Parks and recreation grants (CMI) always looking for new grants
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Hosts and involved
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d		X			Source water protection program
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				Daily on the water intake
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Ordinance enforcement

Community Name:	Ira Township	July 24, 2003
Community Representatives:	John Jones, Chris McLeod, Eric Barnowski, David Lewandowski, Marty Barnes	

Lenox Township Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				x	Prison on private sewers – only one with a problem - past 10 years; pump station problems would be handled by county.
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				Macomb Co. IDEP program – Health Department
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				No Twp ordinance. If they suspect illicit discharge they will contact resident and then refer to Health Department if no response.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b	x				Township hall has a septic system brochure for residents. Twp maintains system at Twp offices. Other Twp facilities are pump-and-haul.
23	Install/Maintain Oil and Grease Trap Devices	2a	x				Inspectors sign off on site plan; Oil trap at DPW and Fire Dept. Part of the site plan review for specific commercial facilities.
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				x	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					County road commission only uses what is necessary. Twp maintains their own parking lot areas.
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					Zoning ordinance limits the number of horses and dogs. No animals allowed in Twp park. Nothing specifically that handles manure
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c	x				Oil traps @ DPW, Fire Dept. and new EMS. Inspectors must sign off on the site plan. Policy - only
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b		x			Working on sewer master plan.

**Lenox Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County, DPW will notify resident if there is a problem and refer to the County if not fixed. Residential & commercial buildings require a soil erosion permit and then the township will issue the building permit
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b	X				Twp does maintenance as necessary (i.e. rip-rap). Storm water retention sediment control. Most of runoff is carried by grassy swales that are normally dry.
24	Install/Maintain Sediment Control Devices	2a, 2b	X				Rip-rap, silt fences, storm retention at Twp park.
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	X				County on an as needed basis – DPW will do clean up in response to citizen complaints.

**Lenox Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	County				Brochures available for County program. As residents call they will be referred to Health Department
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a		X			Twp is going to a single contractor Twp wide and will have residential recycling as part of the contract. Yard waste pickup will not be part of contract but may be available individually. Pine Tree Acres landfill currently picks up litter along Gratiot.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					
22	Increase Public Awareness	All	X				Newsletter (once/year), brochures in foyer area, website www.lenoxtpw.org , public access channel
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				Fertilize park and township facilities – local contractor, slow release fertilizer monthly, pesticide weekly (inside building only)
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d					

**Lenox Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X	X			Retention (park), EMS building will also have another retention area (SHORT -TERM)
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b		X			No storm sewers CB will be put in parking lot & cleaned as needed
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Spot check the existing sewer (monthly)
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d	X				No storm sewers. Retention pond – take a look when they are out there.
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Township offices, park behind office, fire station
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c				X	
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	County				County does roads – Twp maintains parking lots with backpack blower
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Try to put in diversion to natural drains. Sheet flow, restricted catch basin on new developed.

**Lenox Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b		County			County MNFI available November 1st
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d					
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Always look out for possible property. Depends on the site/location
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b	X				Woodland ordinance
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X				Woodland
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					No ordinances
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				Tree ordinance to protect against clear cutting. Open space/landscaping requirement
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					
46	Utilize Habitat Restoration Techniques	2a					

**Lenox Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b					No outreach programs done yet
14	Implement Financial Solutions	All					
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Participates in Anchor Bay Watershed meetings.
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Ordinance enforcement officer

Community Name:	Lenox Township	July 29, 2003
Community Representatives:	Mack Weaver, George Nichols, Cam Trombley	

**Macomb County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	X				IDEP – MCHD, MCPWO, MCRC Swim Team – MCHD
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	X				IDEP – HD and PW MCPWO - All county drains completed by end of 2004 MCRC – To be completed by 2007
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b	X				MCHD – Brochures; presentations; GW Stewardship Program Operation & Maintenance Ordinance Direct mailing to new residences
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Installed at some county facilities No policy/ordinance requirement
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a	X				Calibrate for a maximum of 450 tons. Have also used liquid deicers.
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c	X				Hotline; stenciling; no dumping signs on drains and road easements. Reviewing parking lots at county facilities to control pollutants.
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b					

**Macomb County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	X				CEA; APA – County Projects; MCRC is also APA; Rewriting Ordinance; Updating Brochures (1) Builders & Developers (2) Homeowners
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b	X				CEA; APA – County Projects; MCRC is also APA; Rewriting Ordinance; Updating Brochures (1) Builders & Developers (2) Homeowners
21	Implement Streambank Stabilization Measures	2a, 2b	X	X			Drain Projects: Developing Maintenance Team for (1) Removing Obstructions (2) General Maintenance (short term). Road design rip-rap and stream stabilization at road crossings (#25 also). Follows MDOT standards.
24	Install/Maintain Sediment Control Devices	2a, 2b					
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	X	X			Developing maintenance team (short term)

**Macomb County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	X				Program through MCHD; announced through website and hot line. Separate area for county facilities. Once or twice per month (satellite sites). Year round facility available at MCHD. Clean sweep program for pesticides
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				MCHD, MCPWO and MSU extension recycling education program. Paper recycling program at County facilities. Adopt-A-Road program; Road side clean up. Jail Trustees program (Roads, County Complex and Drains). Updating solid waste management plan.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c	X				Grounds keepers trained on environmental measures; storm water operator training; soil erosion certification; Pesticide Application Certification
22	Increase Public Awareness	All	X				Brochures; website; School (Education Program); Co-Op Extension Program: Public Participation Meetings, watershed identification signage; report-a-polluter signage; bumper stickers; displays in county facilities and schools; employee newsletter (MCPWO)
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				Clean Sweep Program (collection & disposal); Generally do not use at County facilities; Larvicide for West Nile Control; used at MCRC sites.
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d	X				MSU Extension; Brochures; Public Education; Employee Newsletter

**Macomb County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d				X	
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b	X				Regular Program (MCRC)
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Part of site plan review and pre construction meetings. County encourages but does not regulate.
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d				X	
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Part of IDEP – made corrections; downspout disconnection program; increasing impervious areas when possible; native plant landscaping; Roads will complete IDEP by 2005
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c	X	X			Maintenance Team (short-term)
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				County also sweeps own facility areas (1/4 by); Required as part of SESC regulation. MCRC regularly performs sweeping.
40	Reduce Directly Connected Impervious Surfaces	4c, 4d					

**Macomb County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b	X				Currently, PEDD is conducting a countywide natural feature inventory (MNFI) that will be available in GIS or hardcopy format for each CVT by Winter 2003.
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d					
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d		X			The MNFI and wetland surveys, along with an update to land use will provide greater access to this information by Spring 2004
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b	X				Currently, PEDD is working on sample ordinance for farmland, woodlands, and wetland protection for communities to adopt
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X				As a matter of policy, the PEDD promotes natural resource protection into the planning process
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d					Protect as part of SESC
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					Supports the efforts of education as provided by the North Branch Clinton River Watershed Group as an example that can be duplicated elsewhere in County. Pursuing the establishment of a wetland bank along the Clinton River.
46	Utilize Habitat Restoration Techniques	2a					Promoted through policy that can be duplicated by local units of government

**Macomb County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b					MSU Extension Programs
14	Implement Financial Solutions	All	X				Is participating, and plans to participate in Grant Writing and Applications for environmental planning. County has recently hired Grants coordinator. IDEP grants. Budget request for 2004 & 2005
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Actively participates in all six prominent watershed groups that include areas of Macomb County. Facilitates most of the groups (CREW; North Branch; Red Run; Lake St. Clair)
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d	X		X		Investigating adoption of storm water ordinance (Long-term), Revising SESC ordinance currently. Sanitary code and O&M Ordinance.
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				MCHD does monitoring for quality in Anchor Bay and territory areas
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Currently have provisions in ordinance and procedures available. Increasing capabilities through additional staffing and updated ordinances.

Community Name:	Macomb County	September 4, 2003
Community Representatives:	Lynn Arnott-Bryks, Gerard Santoro, Lynne Yustick, Keith Graboske, Lara Sucharski, Joe Pacella, Gary White	

**Macomb Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				County IDEP. All sewered within Anchor Bay but there may still be some OSDSs that will be eliminated when located through the IDEP Program.
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c		X			Respond to complaints; will develop program under Phase II
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b					
23	Install/Maintain Oil and Grease Trap Devices	2a		X			
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					Economically driven – only do parking areas at Twp facility
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b			X		Ordinance to limit of animals but does not address manure disposal. Will be developing new ordinances.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c		X			Phase II
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X				Master sewer plan

**Macomb Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County program. Twp refers complaints to county.
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b				X	Township doesn't have jurisdiction in any watercourses
24	Install/Maintain Sediment Control Devices	2a, 2b					County/state currently
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d				X	Refer to county. Twp does not have any jurisdiction on any watercourses.

**Macomb Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	County				
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a					Individual contracts with trash haulers.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					
22	Increase Public Awareness	All	X				Newsletter; website being developed (www.macomb-mi.gov); cable TV; Consumer Confidence Report; special brochures available at Twp Hall
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a					Contracted out – they minimize application. Fertilize twice per year
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d		X			Link on website; MSU Extension. Have done presentations to garden clubs in the past. Will have brochures available.

**Macomb Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Storm H ₂ O detention on two of their sites (DPW and Main Office)
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b	X				Clean on an as needed basis.
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Annual maintenance on manholes, vactor truck for cleaning ; monitor pump stations remotely and inspect weekly
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d	X				
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c	X				Rear yard storm drains – swale in catch basins – clean if necessary
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				Contractor for own property
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Ordinance requiring buffers and restricting the amount of lot coverage. LID and open space cluster ordinance

**Macomb Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b		X			County Michigan Natural Features Inventory and updated wetlands survey available November 2003. Current information in Master Plan too broad. Will be enacting site by site requirement
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d		X			Township looking at developing park system along river corridors
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d		X			Master Plan and Recreation Master Plan
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b	X				Resource protection linkages – overlay zones; PUD; cluster areas
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d					
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d					
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					No.
46	Utilize Habitat Restoration Techniques	2a				X	No jurisdiction/ownership

**Macomb Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b					
14	Implement Financial Solutions	All					
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Participating in CREWS; North Branch; Anchor Bay
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d			X		
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Code Enforcement Officer Building Inspectors

Community Name:	Macomb Township	August 14, 2003
Community Representatives:	Jerry Schmeiser, Gary Campbell, Jim Van Tiflin	

**City of Marine City
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b				X	No septic or tile fields
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	X				Routinely check. Smoke and dye test sanitary.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b				X	No septic systems
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Restaurants require grease traps to sanitary. Commercial facilities require oil/water separator/oil interceptors on the storm sewer discharge
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	None
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a	X				Reduce from 400 ton to 200 ton, by adding sand to the salt & wiser use of the salt.
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c					Secondary containment on the gas & diesel tanks at the DPW yard.
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X				The city is totally sewered and has their own WWTP. Part of the sewer charge/fee goes into a main operation/replacement fund.

**City of Marine City
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				County program - Respond to soil complaints from residents, then refer to county
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b	X				Will do the maintenance RIP RAP as necessary along the rivers. Also clean and reseed grassy swale area
24	Install/Maintain Sediment Control Devices	2a, 2b					No City owned basins or other devices; grassy swales
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	X				Clean the county drains - community service.

**City of Marine City
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	X				Use the Cottrellville Twp. days to pick up waste. Provide information to residents on where to dispose of hazardous waste
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Recycling & yard waste pickup is available through City trash collector.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					Hazmat, operations, fire, safety for the last 6 years. Nothing specific to environment/storm water control.
22	Increase Public Awareness	All	X				Special mailing, channel 6, some departments have special sections on the website
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a					Pay a contractor to do city property
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d					

**City of Marine City
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d					
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b	X				Cleaned once/yr. – disposal @ sewage treatment plant drying beds
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					Required to put a reducer on the discharge line
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Smoked in the past 5 yrs. Sewer machine used to clean – completely done every 3 yrs. System was combined but has been separated.
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d				X	
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Checked the city buildings. Disconnected downspouts and dye tested sanitary facilities.
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c	X				Periodically – CBs cleaned annually; storm drains as needed
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				All streets, sweeper runs three days a week & M-29 is taken care of by the State
40	Reduce Directly Connected Impervious Surfaces	4c, 4d					Whole City has downspouts unconnected from storm system by ordinance.

**City of Marine City
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b					
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d	X				Purchased 2 lots next to beach
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					No
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Set aside area for bridge-to-bay
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b					
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d					
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				The swales/grassy area is maintained
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d					Don't really have any areas in the City.
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					No
46	Utilize Habitat Restoration Techniques	2a					

**City of Marine City
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b				X	No agriculture area
14	Implement Financial Solutions	All					
15	Implement Institutional Framework for Watershed-wide Actions	All					
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				At point of H ₂ O intake mainly turbidity
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					Code Officer (B. Klassen)

Community Name:	Marine City	August 5, 2003
Community Representatives:	Rick Ames, Michael Nagy	

**City of Mount Clemens
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c	X				No known SSO's at this time. CSO control program completed.
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	X				Eliminate them as they are located if when 300 feet of sanitary – whole city is sewerred
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	X				IDEP grant (CMI). Televis and dye test on a routine basis.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b				X	
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Commercial facilities – required by ordinance
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b	X				"Pooper Scooper " Ordinance requires residents to clean up pet waste.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c					Required devices on development/redevelopment. Stormceptors, etc.
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b					City is completely built out with sewers and they have an infrastructure maintenance and repair fund.

**City of Mount Clemens
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	X				Mt. Clemens is a Municipal Enforcing Agency under the state SESC regulations.
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b	X				
21	Implement Streambank Stabilization Measures	2a, 2b	X				In the park areas – mainly hard engineering. Soft engineering by retention basin @ WWTP
24	Install/Maintain Sediment Control Devices	2a, 2b					
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	X				County does removal. City investigates complaints and refers them to the County as necessary.

**City of Mount Clemens
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	County				County program – City advertises program on cable, at City offices and in flyers
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Recycle center @ city public works garage. Residential leaf collection and yard waste is part of the compost collection.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					
22	Increase Public Awareness	All	X				Website (www.cityofmountclemens.com); catch basin stenciling; brochures; flyers; cable TV.
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a					Services contracted out
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d	X				Cable TV program

**City of Mount Clemens
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Required as part of site plan/development
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b					Have vactor truck and program, however program is currently not funded due to budget cuts
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Have CMOM program developed and implemented (1972 program)
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d				X	City does not have any storm H ₂ O control facilities
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Routine follow up
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c	X				See 27
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				Municipal & private sweeping programs (Downtown Development private) – May to Oct.
40	Reduce Directly Connected Impervious Surfaces	4c, 4d					

**City of Mount Clemens
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b		County			County Michigan Natural Features Inventory and updated wetlands survey available November 2003
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d	X				Several park locations, marina, and boat launch. Boardwalk area planning construction expansion as part of the Bridge-to-Bay program.
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d	X				See 3
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b					
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d					
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				Sleepy Hollow Nature Center, Shady Side Park wildlife plantings
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				Oxbow Lake at Sleepy Hollow
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					
46	Utilize Habitat Restoration Techniques	2a	X				Native planting alternatives utilized.

**City of Mount Clemens
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b				X	
14	Implement Financial Solutions	All	X				IDEP Grant Currently
15	Implement Institutional Framework for Watershed-wide Actions	All	X				CREW; Anchor Bay; North Branch;
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d		X			Currently use policy but are planning an adopting ordinance under Phase II program
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					Water Treatment Plant (L'Anse Cruse Bay) (Southeast of Metro Beach – Crocker & Jefferson) Clinton River e-coli when basin discharges
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Code Enforcement Officer

Community Name:	Mt. Clemens	August 13, 2003
Community Representatives:	Chuck Bellmore	

**City of New Baltimore
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c	X				Ongoing to check sewer system. Check Crapau Creek, on a regular basis
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b				X	Have none in the city
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	X				Ongoing (found 2 last year)
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b				X	No septic
23	Install/Maintain Oil and Grease Trap Devices	2a					
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	No lagoons
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					Visual inspection of trucks and watch how much salt is put down. Economically driven.
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b	X				No animals in park, clean up after waste, animal ordinance.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c					
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b					Master Plan – City is entirely sewered.

**City of New Baltimore
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	X				County program but City monitors permit conditions through Building Dept. and Code Enforcement. City has a \$250/lot maintenance bond for SESC on new development and/or redevelopment
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b	X				
21	Implement Streambank Stabilization Measures	2a, 2b	X				TetraTech helping with Crapau Creek
24	Install/Maintain Sediment Control Devices	2a, 2b	County				Required by county soil erosion permit
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	County				County does it and bills the City (Crapau Creek)

**City of New Baltimore
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	X				Newsletter – let residents know where materials can be taken for safe disposal. DPS yard has an oil drop-off location.
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Trash pick up, curb recycling, yard waste pickup. 2 times/year the city picks up major items.
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c		X			Part of Phase II
22	Increase Public Awareness	All	X				Newsletter (x4); brochures; website www.cityofnewbaltimore.org ; cable channel
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				Contracted applicator, slow release fertilizers
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d	X				Newsletter articles/minimize H ₂ O

**City of New Baltimore
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b	X				One per year(DPS); have new vactor truck.
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					None, use county specs for building
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Televise, dye test, smoke test
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d					
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c	X				Clean annually
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				MDOT/County (M29), Contractor does the rest of the City twice/year.
40	Reduce Directly Connected Impervious Surfaces	4c, 4d					

**City of New Baltimore
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b		County			County is doing MNFI inventory that will be available to the City
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d	X				Floodplain ordinance
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Recreational Master Plan
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b	X				Floodplain and Woodland Ordinances
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X				
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				Woodlands ordinance. Inventory of property 1 acre or more, must leave 37% of trees. Wetlands are regulated through the State.
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					No
46	Utilize Habitat Restoration Techniques	2a					

**City of New Baltimore
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b				X	No agriculture
14	Implement Financial Solutions	All		X			Parks and Recreation seeking funding. Will be evaluating budget for Phase II
15	Implement Institutional Framework for Watershed-wide Actions	All	X				
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				Water treatment plant intake
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Code Enforcement Officer and Building Department

Community Name:	New Baltimore	August 8, 2003
Community Representatives:	Joe Grajek, Craig Higgins, Ron Ziehmer	

**Village of New Haven
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c	X				At least one bulk headed diversion chamber. System being TV'ed currently to determine integrity. Separation program completed in 1982.
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				County IDEP program. Have ordinance in Village requiring connection to sewer if within 200 feet.
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b	County				
23	Install/Maintain Oil and Grease Trap Devices	2a	X				Engineering Standards Ordinance requires stormceptor or similar type device
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					Homeowners association in some areas require residents to clean up after pets
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c		X			Catch basin identification
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b					Sanitary sewer capacity study included "build out" projection throughout the village.

**Village of New Haven
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b	County				
24	Install/Maintain Sediment Control Devices	2a, 2b	X				Engineering standards ordinance
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	County				

**Village of New Haven
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	X				Annual Village clean-up. Fire Department has collection operation
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Curb side recycling and yard waste collection
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					
22	Increase Public Awareness	All	X				Cable TV channel; Developing newsletter (short term); Special mailings
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				Do not use on village property
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d		X			Will implement program to send out information to residents

**Village of New Haven
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Construction required by Engineering Standard Ordinance Maintenance Agreement provisions with the Village
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b	X				As needed – the whole system has been cleaned once.
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Site Plan / Engineering plan review requires green belts on new development
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				TV program underway
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d	X				Maintenance Agreements by ordinance
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c					Cleaning and replacement programs
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				Monthly during summer season
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Green belt under site plan review , PUD, & open space ordinance

**Village of New Haven
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b	X				County Michigan Natural Features Inventory and updated wetlands survey available November 2003. Village Master Plan & Planning Commission study.
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d	X				Identified in Master Plan – along Salt River
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					
10	Identify Areas for Recreation Enhancement	1c, 2d		X			Possible nature trail along Salt River corridor
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b	X				No ordinance but under Master Plan and site plan review. Zoning & Engineering Standards ordinances
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X				Master Plan
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d		X			
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				Master Plan; site plan review; tree ordinance
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					
46	Utilize Habitat Restoration Techniques	2a		X			

**Village of New Haven
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b				X	
14	Implement Financial Solutions	All	X				Grants; fees; and funding
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Support watershed planning effort but not currently participating on steering committee. Jeff Bednar represents on Technical Committee.
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					Engineering Standards Ordinance
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Enforcement Officer

Community Name:	Village of New Haven	August 26, 2003
Community Representatives:	Robert Crayton, Paul Guinnane	

City of Richmond
Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	None
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				Septic systems in one area, handled by County Health Department
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				County program; problems addressed by the City as they are found.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b	County				MCHD – County 'time-of-sale' ordinance
23	Install/Maintain Oil and Grease Trap Devices	2a					
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a				X	
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					Economic incentive, but no real program
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					Animal control ordinance; limited farm land available within the city – therefore no sheep or horses; more than 3 dogs requires a kennel license. However, nothing addressing pet waste.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c	X				Problems are addressed as they arise. The City is either notified by residents or they come across problems on the job.
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X				Part of sanitary sewer master plan, in the process of updating the plan – updated on a 3-5 year basis.

City of Richmond
Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				Construction permit required, builder must show a copy of the Macomb County issued permit; City retains a copy of the permit
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b				X	No streambank under City jurisdiction
24	Install/Maintain Sediment Control Devices	2a, 2b					
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d					Not normally – Macomb County takes care of this

City of Richmond
Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c					Richmond Township & Macomb County have programs and the City participates; informs residents through calendar and newsletter
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Curbside recycling thru Waste Management, annual newsletter lets residents know what can be recycled
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					No formal program
22	Increase Public Awareness	All	X				Calendar, annual newsletter, cable television channel, website & catch basin stenciling; MSU Extension does a ground water education program. Wellhead protection plan – specific area & handouts are available; future plans to expand program are being developed.
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				No pesticides, herbicides or fertilizers used on municipal property. Use MSU Extension for public education.
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d					No formal program, maybe thru MSU Extension;

**City of Richmond
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				New development requires detention/retention ponds
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b	X				Clean catch basins & vector storm sewers, materials in separate drying beds at the wastewater treatment facility & then the landfill; see #34
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				Ongoing, doing a clean up now (first time); televise & clean.
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d					No storm water control measures have been discussed
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Yes – all facilities are up to date & checked out
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c	X				Vector out catch basins, cleaned annually; televised on an as needed basis; see #8
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				Every two weeks – all streets
40	Reduce Directly Connected Impervious Surfaces	4c, 4d	X				Construction is mostly done through zoning ordinances that encourage alternatives to addressing storm water; detention and retention ponds are required; County plans reviewed by engineer

City of Richmond
Anchor Bay Storm Water Management Survey

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b		County			Land use master plan identified potential wetlands & woodlands; Macomb County is providing Natural Features Inventory
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d					Separate park & recreation master plan. Not currently seeking land for conservation since adequate park acreage is available or the City population.
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					No plans
10	Identify Areas for Recreation Enhancement	1c, 2d	X				Developers are required to set aside recreational areas (i.e. condominium development on 33 mile and Plank Rd.)
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b	X				PUD
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d					
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d				X	Not under City jurisdiction
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				PUD ordinance; areas are set aside to preserve wetlands & woodlands; woodlands preservation ordinance prohibits the removal of trees within the building footprint and 10' in diameter
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					No
46	Utilize Habitat Restoration Techniques	2a	X				PUD optional overlay district guides landowners & developers to keep valued environmental features and systems intact.

**City of Richmond
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b				X	No agricultural area
14	Implement Financial Solutions	All					No – not currently seeking funding sources
15	Implement Institutional Framework for Watershed-wide Actions	All					Not routinely attending
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d					
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	County				Relies on County enforcement

Community Name:	City of Richmond	July 21, 2003
Community Representatives:	Paul Fejedelem, Jeri Decator, Bill Ruff, Larry Cottingham, Troy Jeschke, & Matt Rathack	

**Richmond Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	County				County IDEP. ± 25 factures in entire township
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	County				County IDEP
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b	X				Pamphlets available at Twp from MSU Extension
23	Install/Maintain Oil and Grease Trap Devices	2a					
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a					Possibly adding to twp ordinances
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b					
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c				X	
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X				Master plan update – focus where Twp wants development, etc.

**Richmond Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b	County				Need to have a copy of the permit before they can build
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b				X	
21	Implement Streambank Stabilization Measures	2a, 2b	County				
24	Install/Maintain Sediment Control Devices	2a, 2b	X				Zoning ordinance – site plan review
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	County				Residents petition the County for cleanout.

**Richmond Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	X				Clean up day every spring
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				Waste management – curb side recycle; yard waste pickup;
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c					
22	Increase Public Awareness	All	X				Website; newsletter; cable TV; "Voice" newspaper; pamphlets; brochures
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a					Not used on Twp property
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d					

**Richmond Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				Require as part of new development
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b				X	
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b					
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d				X	
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				Checked facilities, removed downspout connections.
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c				X	
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b				X	County does M-19
40	Reduce Directly Connected Impervious Surfaces	4c, 4d				X	

**Richmond Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b		County			County Michigan Natural Features Inventory and updated wetlands survey available November 2003
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d					County wide greenways plan and trails network
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d					Wetland constructed at 33 mile & Place Rd. (private)
10	Identify Areas for Recreation Enhancement	1c, 2d					
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b					Farmland Protection program. Transfer Development Rights (TDR), Purchase Development Rights (PDR)
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d					
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d					
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d					33 mile & Place Rd. Deland Rd. between Pratt & Weber (Private)
46	Utilize Habitat Restoration Techniques	2a					

**Richmond Township
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b					"No till" used by about 50% of farmers By individual choice
14	Implement Financial Solutions	All					
15	Implement Institutional Framework for Watershed-wide Actions	All	X				Anchor Bay (Chris McLoud represents Twp). Twp also participates in North Branch & Belle River Watersheds
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d	X				Commercial & Industrial site plan reviews
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d					
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				

Community Name:	Richmond Township	August 26, 2003
Community Representatives:	Gordon Fuerstenau, Cindi Greenia	

**St. Clair County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Illicit Discharge							
11	Identify and Control Sanitary Sewer Overflows (SSOs)	1a, 1b, 2a, 3a, 3b, 3c				X	
12	Identify and Eliminate Failing On-Site Sewage Disposal Systems (OSDSs)	1a, 1b, 3a, 3b	X				- SCHD and SCDO IDEP programs are currently in the Anchor Bay and Pine River Watersheds. SCHD performs IDEP for SCRC MS4s.
13	Identify and Eliminate Illicit Discharges	1a, 1b, 2a, 3a, 3b, 3c	X				- SCHD handles the enforcement and correction of failing OSDS and refers sanitary sewer problems to municipality. - The SCHD and SCDO refer chemical illicit discharges to SCEM and PEAS.
18	Implement Septic System Maintenance Measures	1a, 1b, 2a, 3a, 3b	X				- SCHD has OSDS maintenance brochures - SCHD has sanitarians on staff to assist residents with maintenance.
23	Install/Maintain Oil and Grease Trap Devices	2a	X				- SCRC - Oil separators inside the central service station. - SCDO requires devices on new developments where it has jurisdiction.
31	Manage Lagoon Systems and Package Wastewater Treatment Plants	1a, 1b, 2a, 3a		X			- SCDO has proposed using wetlands for WW treatment in Avoca. - SCDO Planning to monitor WWT discharges to County drains and implement new effluent guidelines (short term)
32	Minimize Salt and De-icing Chemicals Usage	2a, 3a					- SCRC experimented with the use of a salt alternative and new salt dispersal equipment. Deemed a failure.
39	Reduce Bacterial Runoff from Domestic Animals and Wildlife	1a, 2a, 3a, 3b		X			- SCHD and SCDO refer agric. bacteria prob. to the MDA (short term). - SCAS uses sanitary sewer for all animal waste.
41	Reduce/Eliminate Oil/Chemical Discharges	2a, 3a, 3c	X				- Education of HHW disposal at SCES - SCHD brochure for IDEP program and Illicit Discharge Reporting Hotline - SCEM responds to chemical spills on limited basis. - SCHD refer chemical discharges to SCEM and PEAS
45	Utilize Comprehensive Planning for Wastewater Treatment Systems	1a, 1b, 2a, 2b, 3a, 3b	X				- SCC Master Plan identifies as a priority.

**St. Clair County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Soil Erosion							
7	Control Soil Erosion	2a, 2b		X			- Soil erosion ordinance is currently being reviewed by the MDEQ for the SCRC. - 17 SCRC, 2 SCDO, and 1 SCHD staff have SESC certification
19	Implement Soil Erosion & Sedimentation Control (SESC) Programs	2b	X				- SCPWO manages SESC program for the entire county.
21	Implement Streambank Stabilization Measures	2a, 2b	X				- Both engineered and bio-engineered methods used on SCDO projects. - Standard SCRC ditch stabilization and occasionally on streams for road projects.
24	Install/Maintain Sediment Control Devices	2a, 2b	X	X			- SCDO is developing new storm water rules to require sediment basins for developments under their jurisdiction (short term) - SCDO reviews developments at the request of municipalities (few requests) (current) - SCRC/ SCPWO SESC Program
37	Prevent and Remove Flow Obstructions	1a, 1b, 4d	X				- SCDO has a maintenance program to remove obstructions in County drains. Jail crews used. - SCRC upon request or need.

**St. Clair County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Public Education							
1	Conduct Household Hazardous Materials Management Programs	2a, 3a, 3c	X				- SCES conducts HHW program. Drop off by appointment at Landfill. Occasional outreach program to southern end of County.
6	Continue/Expand Litter and Debris Clean-up and Recycling Programs	2a	X				- SCRC Adopt a Road Program - Recycling program through SCCES. - Admin. Bldg operates paper recycling
16	Implement Municipal Employee Training Programs	1a, 1b, 3a, 3b, 3c		X			- Plans to develop municipal training programs to meet Phase II requirements.
22	Increase Public Awareness	All	X				- Brochures, presentations, Earth Day, Workshops, EE Network, Adopt a Stream, website, newsletters through MSU Extension, SCHD, SCMPC, SCDO, SCRC, SCPRC - SCRC, SCMPC, SCPRC partnered with NRCS and the SCCD's pilot bioengineering project on the Pine River.
42	Reduce Fertilizer, Pesticide and Herbicide Usage	1b, 2a	X				- SCPRC has an active policy instructing park maintenance to minimize fertilizer, pesticides and herbicide usage. - SCDO and SCRC do not use fertilizers, pesticides, and herbicides within its easements and drains.
43	Support Environmental Friendly Lawn and Garden Maintenance	2a, 2b, 2c, 2d, 4b, 4c, 4d	X	X			- SC MSU Ext. Master Gardener Program and Horticultural Program, - SCHD Garden club guest lecturer - Develop brochures (short term)

**St. Clair County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Infrastructure							
4	Construct/Maintain Storm Water Storage Facilities	1a, 1b, 2c, 4c, 4d	X				- SCDO requires wet/dry detention basins for developments under its jurisdiction and reviews development plans upon municipal request. - Encourages wet/dry detention ponds too.
8	Enhance Catch Basin Functionality	1a, 1b, 2a, 2b, 3a, 3b	X				- SCDO uses a vactor truck on the limited number of enclosed drains. - SCRC contracts vactor truck's to clean out catch basins for enclosed drains 4x's per year.
25	Install/Maintain Storm Sewer Infiltration Treatment Devices	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d		X	X		- SCDO has proposed enhanced infiltration in new stormwater rules. (long term) - Regional detention basins proposed for the Dana Drain. (short term)
27	Maintain Sanitary Sewer Infrastructure	1a, 1b, 3a, 3b	X				- SCRC/ SCPWO - Algonac Wastewater Treatment Plant. Sewer infrastructure is maintained by local municipalities.
28	Maintain Storm Water Controls	1a, 1b, 2b, 2c, 3a, 3b, 4c, 4d	X		X		- SCRC cleans out catch basins on an annual basis. - SCDO inspects first flush basins for sediment accumulation. - SCDO would like to perform more regular inspections. (long term)
29	Manage Public Facilities	1a, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d					
34	Perform Storm Sewer System Maintenance and Drain Cleaning	1a, 1b, 2a, 3a, 3b, 4c	X				- SCDO performs drain cleanouts upon maintenance request or as part of their regular maintenance program. - SCDO does regular maintenance on enclosed drains. - SCRC performs drain cleanout upon request or need.
35	Perform Street Sweeping	1a, 1b, 2a, 3a, 3b	X				- SCRC performs street sweeping 4 x/s per year in curbed areas.
40	Reduce Directly Connected Impervious Surfaces	4c, 4d			X		- SCDO has proposed new storm water rules that will address this issue. (long term)

**St. Clair County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Habitat							
2	Conduct Natural Feature Inventory and Assessments	2a, 2b	X				- SCMPC Master Plan identifies natural areas for protection.
3	Conserve Riparian Land for Future Parks and Public Access	1c, 2a, 2d	X				- SCPRC acquired property along Lake Huron in 2003. - SCMPC Master Plan identifies distinct districts for development and natural features conservation.
5	Construct Wetlands	1a, 2a, 2b, 2c, 4c, 4d		X			- SCDO constructed wetland proposal for Avoca wastewater treatment. - SCDO proposes to construct wetland areas in regional detention basins for Dana Drain. (short term)
10	Identify Areas for Recreation Enhancement	1c, 2d	X				- SCPRC Master Recreational Plan has identified inland waterways for recreational use.
17	Implement Natural Features Protection Ordinances	2a, 2d, 4b	X				- SCRC/SCPWO submitted a Soil Erosion Ordinance in 2003 to the MDEQ for review.
26	Integrate Natural Resource Protection into the Planning Process	1a, 1b, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 4b, 4c, 4d	X		X		- SCMPC Master Plan stresses the importance of natural resource protection throughout the Master Plan. - SCDO is developing new storm water rules for development within its jurisdiction that includes better natural resource protection. (long term)
30	Manage Riparian Corridors	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				- SCDO does a limited amount of river restoration, log and trash obstruction removal under maintenance provisions of the Drain Code.
36	Preserve and Enhance Existing Wetlands/Woodlands	1a, 2a, 2b, 2c, 2d, 4c, 4d	X				- SCDO inspects all new developments under its jurisdiction for wetlands impacts and coordinates with the DEQ. - SCRC held a Wetland Identification workshop 6/03
44	Support Wetland Mitigation Banking	2a, 2b, 2c, 2d, 4b, 4c, 4d			X		- SCC Administration is investigating wetland banks - SCDO is investigating wetland banks for regional detention areas.
46	Utilize Habitat Restoration Techniques	2a					

**St. Clair County
Anchor Bay Storm Water Management Survey**

BMP #	BMP	Goal & Objective	Current	Short Term	Long Term	N/A	Comments
Planning							
9	Facilitate Generally Accepted Agricultural Management Practices (GAAMPs)	1a, 1b, 2a, 3a, 3b	X	X			- SCHD and SCDO IDEP refers agricultural problems to the SCCD. - SCHD promotes education coordination with SCCD through the EE Network. - SCDO plans to encourage buffer strips along drains by notifying landowners of erosion problems. (short term)
14	Implement Financial Solutions	All	X				- Grants are currently being administered by the SCHD, SCDO, SCRC, SCPRC, SCMPC - SCHD raised its septic and well fees to help fund the Storm Water Permit requirements.
15	Implement Institutional Framework for Watershed-wide Actions	All	X				- Watershed Planning groups have been established for four of the seven sub- watersheds of SCC. - SCC coordinates water quality issues with Macomb through the Macomb/ St. Clair Inter-county Advisory Group
20	Implement Storm Water and Water Resource Protection Ordinances	2a, 2b, 2c, 2d, 3a, 4b, 4c, 4d			X		- SCDO applied for a 2001 grant to develop a Storm Water ordinance- denied. - SCDO is developing new storm water rules that will require more BMPs for developments under its jurisdiction. (long term)
33	Monitor Water Quality and Quantity	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4a, 4c, 4d	X				- SCHD IDEP, Beach Monitoring Program, Drain Monitoring Program - SCDO IDEP - SC MSU Ext. - Adopt-a-Stream Program
38	Provide Sufficient Enforcement Capability	1a, 1b, 2a, 2b, 2c, 2d, 3a, 3b, 3c, 4c, 4d	X				- Limited enforcement at the SCDO and SCRC/SCPWO SESC because of limited staff #s. - SCHD IDEP program, Sanitary Code, Drain Code - SCMPC Solid Waste Management Ordinance

SCHD: St. Clair County Health Department
SCES: St. Clair Environmental Services
SCCD: St. Clair Conservation District

SCDO: St. Clair County Drain Office
SCRC: St. Clair County Road Commission
SCPRC: St. Clair County Parks and Recreation Commission

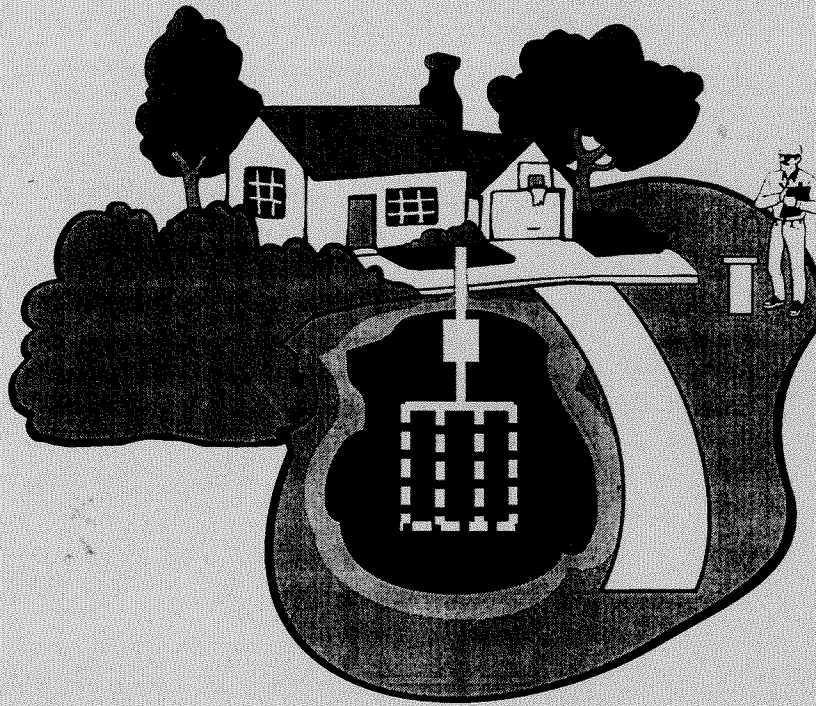
SCMC: St. Clair County Metropolitan Planning Commission
SCPWO: St. Clair Public Works Office
SC MSU Ext: St. Clair County Michigan State University Extension Office

Community Name:	St. Clair County
Community Representatives:	SCRC: K. Weston, SCHD: K. O'Reilly, SCDO: F. Fuller, SCPRC: M. Brochu, SCMPC: G. Donaldson

Appendix G:

**Macomb County's Onsite Sewage Disposal
and Onsite Water Supply
Evaluation and Maintenance Ordinance**

Regulations Governing On-Site Sewage Disposal And On-Site Water Supply System Evaluation and Maintenance In Macomb County, Michigan



Effective August 1, 2002

Macomb County Health Department
Environmental Health Services Division

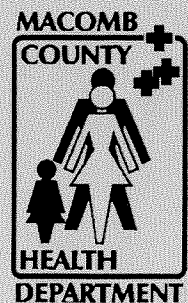


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ARTICLE 1 – TITLE, PURPOSE, AUTHORITY AND JURISDICTION

SECTION 1.1 – Title

These Regulations shall be identified by the title “Regulations Governing On-site Sewage Disposal and On-site Water Supply System Evaluation and Maintenance in Macomb County, Michigan”.

SECTION 1.2 – Purpose

These Regulations are adopted to protect the quality of water resources, on-site water supplies and the natural environment and to protect the public health by providing an evaluation and maintenance program for on-site sewage disposal and on-site water supply systems in Macomb County by: (1) regulating the sale or transfer of parcels containing on-site sewage disposal or on-site water supply systems; (2) regulating on-site sewage disposal and water supply system evaluations; and (3) effecting compliance with the provisions of the Public Health Code. It is not the intent of this Regulation to cause existing functional systems which do not meet current construction standards, and in the case of on-site water supply systems which are not subject to contamination, to be brought into compliance with such standards.

SECTION 1.3 – Authority

These Regulations are adopted pursuant to authority conferred upon local Health Departments by Section 2441(1) of the Public Health Code.

SECTION 1.4 – Jurisdiction

The responsibility for administration and enforcement of these Regulations shall reside with the Health Officer of the Macomb County Health Department. These Regulations, including all amendments, shall be in full force and effect throughout all areas of Macomb County, incorporated and unincorporated.

ARTICLE II – DEFINITIONS

SECTION 2.1 – General Provisions

When not inconsistent with the context, words used in the present tense include the future, words in singular number include the plural number, and words in the plural number include the singular number. The word “shall” is always mandatory, and not merely directory. Words and terms not defined herein shall be interpreted in the manner of their common usage.

SECTION 2.2 – Definitions

Absorption system - That part of a disposal system in which septic tank effluent is distributed to a subsurface trench or bed that allows the effluent to be absorbed and treated by the surrounding soil; also called drain field, disposal field, tile field or disposal bed.

Appeal – A formal written request for administrative review of any decision, action, or failure to act, on the part of the Health Officer, pursuant to the provisions of these Regulations.

Approved/Approval – Approved or approval denotes that a condition, facility, thing, premise, action or use, is in satisfactory compliance with the intent, purpose and applicable standards of these Regulations.

Available Public Sanitary Sewer – A public sewerage system located not more than 200 feet at its nearest point to a premises from which sanitary sewage originates, the use of which is permitted by the responsible governmental entity.

Dosing Chamber – An approved tank or receptacle used for the purpose of retaining overflow from a septic tank for controlled discharge to an on-site sewage disposal system by means of pumps or siphon devices.

Effluent – The partially treated sanitary sewage outflow discharge of a septic tank or similar detention device.

Failure of On-site Sewage Disposal System - The backup of sewage into the structure; direct discharge of effluent to a water course, surface drain or the ground surface; discharge from the disposal system to a storm sewer; presence of liquid in the septic tank above the invert of the septic tank outlet; failure or dilapidation of the physical septic tank structure, other system components; or discharge of sewage from the structure which does not reach the disposal system.

Failure of On-site Water Supply System – Unsafe water sample, substantial non-conformance with water well construction requirements or substantial non-conformance with water well isolation from contamination source requirements.

Habitable Building – A part or all of a temporary or permanent building, facility or structure, where persons reside, sleep, cook, are employed or congregate.

Health Department – The Macomb County Health Department.

Health Officer - The Administrative Officer who is in charge of the Macomb County Health Department or his/her authorized designee.

On-site Sewage Disposal System – Any device or facility installed or constructed to store, treat or dispose of sanitary sewage or human excreta from premises where a public sanitary sewer is, or was, unavailable for use at the time for such construction or installation.

On-site Subsurface Sewage Disposal System, Conventional – A system which includes a building sewer, one or more septic tanks, a drain field, and all associated connections, fittings, and appurtenances.

On-site Subsurface Sewage Disposal System, Engineered Alternative – A facility constructed in accordance with a plan prepared by a professional currently licensed under Act 299, P.A. 1980 or Act 368, P.A. 1978, Part 184, which employs design features, processes, construction or operational methods significantly different from those which apply to a conventional on-site subsurface sewage disposal system.

On-site Water Supply - A system of pipes and structures through which water is obtained, including but not limited to: the source of the water such as wells, or hauled water storage tanks, pumping and treatment equipment, storage tanks, pipes and appurtenances used or intended to furnish water for potable use.

Owner – Any person, agency, firm or corporation having a legal or equitable interest in the property.

Parcel – A lot or a distinct portion or tract of land containing an on-site sewage disposal or on-site water supply system.

Person – Any individual, natural person, trustee, court appointed representative, agency, group, association, organization, firm, corporation, club, institution, partnership, or other legally definable entity.

Premises – Any house, building, structure, facility or improvement from which sanitary sewage originates or which is served by an on-site water supply system.

Public Health Code – Public Act 368, 1978, as amended; MCLA 333.1101 et.seq.

Public Sanitary Sewer – A system of pipes and conduits used or intended to be used for the collection and transportation of sanitary sewage, which is owned, operated and maintained by a governmental entity.

Public Water Supply - A water supply which provides water for drinking or household purposes to persons other than the supplier of water, as defined in MCL 325.1002, A copy of which may be obtained at the Macomb County Health Department.

Registered Evaluator - An individual who is certified, who satisfactorily complies with the registration requirements of these Regulations, and whose name is on the Health Department's registration list.

Registered Well Drilling Contractor - A person holding a valid certificate of registration as a well drilling contractor, as provided in Sections 12703 to 12715 of the Public Health Code.

Regulations – Regulations governing on-site sewage disposal and on-site water supply system evaluation and maintenance in Macomb County, Michigan.

Sanitary Sewage – Any water transported waste material produced by any toilet, sink, bathtub, urinal, garbage disposal, shower, or laundry device; and human body waste material in any form, originating within or upon any premise. Excluded from the definition are storm drainage, and waste waters from roofs, foundation drains, water softening devices, industrial and commercial processes, and commercial laundries.

Septage - Any human excrement or other domestic waste, including gray water and other material or substance removed from a portable toilet, septic tank, seepage pit, cesspool, sewage lift station or other enclosure, but does not include liquid industrial waste.

Septic Tank – A buried watertight, covered tank designed and constructed to receive and partially treat sanitary sewage by physical settling and anaerobic decomposition prior to its release to a drainfield.

System – An on-site sewage disposal system and/or on-site water supply system.

Transfer Evaluation - The process of determining, in relation to the sale or transfer of a parcel containing a system, the condition and state of acceptability of the system. This process includes observations, sample collection, information gathering, the exercising of judgments, and preparation of a report of findings.

ARTICLE III – GENERAL PROVISIONS

SECTION 3.1 – Restrictions on Sale or Transfer of a Parcel Containing an On-Site Sewage Disposal System or an On-Site Water Supply

- Subject to the provisions of Section 5.2, there shall be no sale or transfer of a parcel containing an on-site sewage system or on-site water supply system until all of the following have occurred:

- A. The report of a transfer evaluation by a registered evaluator has been submitted to the Health Department.
- B. At the time of the transfer evaluation, the Health Department has determined that the condition or operation of the system has not failed or any necessary system remediation has been completed or assured and accepted by the Health Department.
- C. The Health Department has issued its authorization for sale or transfer of the parcel.

ARTICLE IV – POWERS AND DUTIES OF THE HEALTH OFFICER

SECTION 4.1 - General Provisions

The Health Officer is responsible for regulating the evaluation, operation and maintenance of all on-site sewage disposal and on-site water supply systems within Macomb County. The Health Officer is also empowered to exercise control over on-site sewage disposal and on-site water supply systems regulated by others when so authorized by the public agencies possessing statutory jurisdiction over such on-site sewage disposal and on-site water supply systems.

SECTION 4.2 - Power to Establish Policy, Criteria and Standards

The Health Officer is empowered to establish criteria, policies and standards concerning the application and interpretation of these Regulations, and for the purpose of carrying out the responsibilities delegated to the Health Officer by law.

ARTICLE V – TYPES OF EVALUATIONS

SECTION 5.1 – Transfer Evaluations

A transfer evaluation shall consist of visual and olfactory observations of the on-site sewage disposal system, information gathering, pumping of septage, inspection of the condition of the septic tank, absorption system, pumps, filters and other important features of the disposal system; visual observation and water quality sampling of an on-site water supply system; and the preparation of a report. Water samples shall be collected and analyzed at a laboratory certified by the Michigan Department of Environmental Quality to determine the presence of coliform bacteria, nitrate concentration, and other contaminants as determined by the Health Department. Transfer evaluations shall be valid for one year from the date of evaluation.

SECTION 5.2 – Exemptions

A system evaluation is not required by Section 3.1:

- A. If as a condition of sale or transfer, and upon written demonstration to the Health Department, the structure is to be connected to an available public sanitary sewer and/or public water supply within six months of the sale or transfer.
- B. During the first three years after original occupancy.
- C. If a transfer evaluation occurred within one year of the date of sale or transfer, and the pertinent transfer evaluation report was filed with the Health Department.
- D. When a mortgage or other payment obligation is refinanced.
- E. If the premises shall be demolished and shall not be occupied after the property transfer.
- F. If the value of the consideration of the sale or transfer is less than \$100.00.
- G. Transfers from a husband or wife or husband and wife creating or disjoining a tenancy by the entireties in the grantor or the grantor and his or her spouse.
- H. Judgments or orders of courts of record making or ordering transfers, except where a specific monetary consideration is specified or ordered by the court.
- I. Transfers that create a joint tenancy between two or more persons where at least one of the persons already owned the property.

ARTICLE VI - EVALUATION REPORTS

SECTION 6.1 – Transfer Evaluation Reports

Evaluation reports shall be prepared on forms approved by the Health Department and submitted as follows:

A report of each transfer evaluation shall be provided by the registered evaluator to the owner, and the Health Department within 20 days of the evaluation. In addition, the report of a transfer evaluation shall be provided to the Health Department no less than five business days prior to scheduled closing of the sale or transfer. A report of an evaluation shall include, at a minimum, information prescribed by the Health Department including observations, findings and recommendations to prevent premature failures. With the evaluation report, the registered evaluator shall provide the owner or owner's agent, with educational materials about system maintenance that have been approved by the Health Department.

Evaluation reports shall include, but are not limited to:

- A. The address of the site.
- B. The parcel identification number.
- C. The name of the owner.
- D. The location of the system(s).
- E. A description of the current operational or functional status of the system(s).
- F. Identification of any necessary repairs or replacement of all or portions of the system(s).
- G. The results of a bacteria and nitrate drinking water test, and other water quality parameters as required by the Health Department.
- H. Other relevant or unusual observations related to the system(s).
- I. Educational materials about system maintenance that have been approved by the Health Department.
- J. Evaluation reports shall be completed on forms approved by the Health Department.

A certified copy of the registered evaluator's report shall be provided to the owner and a copy filed with the Health Department. Such reports shall be freely available to the public through the Freedom of Information Act, MCLA 15.231 et seq.

ARTICLE VII – EVALUATION FREQUENCY

SECTION 7.1 – Transfer Evaluations

All on-site sewage and water supply systems shall have a transfer evaluation prior to the sale or transfer of the parcel; except as provided in Sections 5.2 and/or 7.2.

SECTION 7.2 – Vacant Premises/Winter Conditions

- A. If the parcel or structure served by a system is vacant for more than 10 days prior to closure of transfer or sale, the transfer evaluation shall be delayed until after re-occupancy. In accordance with Section 10.1(C) and Section 10.1(G), notice shall be given to the Health Department not less than 30 and not more than 45 days after the date of re-occupancy of the parcel or structure, and a system shall have a transfer evaluation between 30 and 60 days of the date of re-occupancy of the parcel or structure.
- B. If winter weather conditions preclude completing the transfer evaluation specified in Section 5.1, the transfer evaluation may be delayed at the owners request and with the concurrence of the Health Department.

SECTION 7.3 – Other Evaluations

The Health Department may determine a different frequency of disposal system evaluations:

- a. For non-residential structures;
- b. For unique, unusual or alternative disposal systems; or
- c. When the disposal system is determined by the Health Department to be inadequate for the current use or size of the structure it serves.

ARTICLE VIII – EVALUATOR REQUIREMENTS

SECTION 8.1 – Registration

Persons performing, or intending to perform, a transfer evaluation to comply with the Regulations shall be registered with the Health Department prior to performing such an evaluation.

Registration shall be based on filing an application for registration, payment of a registration fee, evidence of evaluator certification, and the demonstration of knowledge of these Regulations and other criteria deemed necessary by the Health Officer.

The name of the applicant for registration who fulfills all requirements of this ordinance, and other information prescribed by the Health Department, shall be placed on the Health Department registration list. Health Department staff representing the Health Department are exempt from the requirements of this Section.

SECTION 8.2 - Certification Requirements

Individuals shall be certified by an agency or organization approved by the Health Department. The Health Department is authorized to:

- A. Approve a certifying agency or organization after determining that the agency has an acceptable program for training and certifying individuals, and;
- B. Withdraw approval if the organization fails to certify or improperly certifies evaluators;
- C. A registered well drilling contractor is exempt from certification for the evaluation of on-site water supply systems.
- D. If no certifying agency or organization is approved by the Health Department within 90 days after the effective date of these Regulations, the Health Department may, after determining the adequacy of pertinent experience and knowledge, register individuals for up to one year, and subsequently for one year intervals until a certifying agency or organization is approved.

SECTION 8.3 – Removal from Registration List

- A. An evaluator may be removed from the registration list for failure to comply with these Regulations; submittal of unacceptable evaluation reports; submittal of false information on an application for registration or on an evaluation report; or failure to submit missing information within three days of a Health Department request.
- B. The Health Officer may remove an individual from the registration list if that individual is unable to properly perform the evaluation of a disposal system or is negligent in the discharge of his or her duties or responsibilities.
- C. Before the Health Officer removes an evaluator from the registration list, the Health Department shall give written notice to the evaluator.

ARTICLE IX – FAILURES

SECTION 9.1 – Notice

When the Health Department determines or concurs with an evaluator that a system is failing, a notice shall be sent by the Health Department, to inform the owner regarding remedial actions needed to bring the system into compliance.

SECTION 9.2 - Conformance with Permit

If a failing disposal system cannot be connected to an available sewer, any remediation of the failing or potentially failing system must be in conformance with a system repair permit issued by the Health Department.

SECTION 9.3 – Failure Remediation

Upon receiving written notice from the Health Department of non-compliance with these Regulations, the owner, buyer or authorized agent shall, within 30 days, submit a proposed corrective action plan and a good faith estimate or contract for services in order to bring the affected system into compliance with applicable laws. In addition, the owner, buyer or authorized agent shall place into an escrow account, a deposit of a surety or performance bond or cash in an amount equal to one and one-half times the estimated cost of performance of such plan. The Health Department shall review the proposed corrective action plan and amend it as required to conform to federal, state and local laws, rules and regulations. All necessary corrective action shall be completed within 180 days following Health Department approval of the proposed corrective action plan. Once the Health Department gives final approval of the completed corrective action, the system shall be deemed to be in substantial conformance with these Regulations and any affidavit previously filed with the Registrar of Deeds shall be discharged at no cost to the owner. If a system presents an immediate health hazard, the owner or other responsible party shall take such measures, in cooperation with the Health Department, that will immediately reduce or eliminate

the impact of such failure until the full remediation plan can be implemented as described earlier in this paragraph.

ARTICLE X – RESPONSIBILITIES OF PERSONS

SECTION 10.1 – Owner

The responsibilities of the owner of a parcel containing a system include:

- A. Maintaining the system to prevent failure and resulting public health hazards or environmental pollution.
- B. Notifying the Health Department of any known or suspected system failure.
- C. Acquiring a transfer evaluation prior to sale or transfer of the parcel; or complying with Section 10.1(F).
- D. Cooperating with the registered evaluator or Health Department representative by allowing access to the parcel, structures and the system, providing pumping of the septic tank when necessary, providing pertinent information to the evaluator and paying any required fee or charge.
- E. Remediating any system failure:
 - 1. The owner must present documentation to a prospective buyer, prior to closure, that the corrective action plan required in Section 9.3 has been approved by the Health Department concerning who is responsible and how and when the remediation will be completed.
 - 2. If a public sanitary sewer is available, the owner shall apply to the municipality for a permit to connect the structure to the available public sanitary sewer or public water supply system.
 - 3. If no public sanitary sewer is available, the owner shall apply for a permit from the Health Department for any remediation which involves repair, expansion or replacement of the system.
- F. If a system evaluation is exempted under Section 5.2, notifying the Health Department of the sale or transfer and the reason a system evaluation is not required.
- G. Notifying the Health Department of the purchase or acquisition of a parcel or structure served by a system not more than 45 days after the date of occupancy of the parcel or structure if the disposal system had not been evaluated prior to the closing of the sale or transfer because the parcel or structure was vacant or winter conditions prevented the transfer evaluation specified in Section 5.1 prior to purchase or acquisition.

SECTION 10.2 - Registered Evaluator

The responsibilities of the registered evaluator include:

- A. Providing reports of each transfer evaluation in accordance with Section 5.1, Section 6.1 and other applicable provisions hereof.

- B. Providing owners with information on system maintenance. Such information may be in the form of brochures or fact sheets approved by the Health Department.
- C. Participating, upon notice from the Health Department, in administrative conferences, administrative hearings or other compliance or enforcement actions.

SECTION 10.3 – Municipality

Responsibilities of the municipality include:

- A. Notifying the Health Department prior to:
 - 1. Issuance of a permit for additions to a premises served by an on-site disposal system or on-site water supply;
 - 2. Authorization of initial connection of pre-existing premises to the public water system; or
 - 3. Authorization of use changes that would increase the quantity or change the characteristics of wastewater discharged to the disposal system.
- B. Notifying the Health Department when premises formerly connected to an onsite sewage disposal system are connected to the available public sanitary sewer.

ARTICLE XI – APPEALS

SECTION 11.1 – General Provisions

Any person taking exception to, or aggrieved by, a decision, ruling, requirement, violation notice, denial, disapproval or order issued by the Health Officer under these Regulations, after an opportunity for an Administrative Conference with the Health Officer or his/her designated representative, has the right to a contested case hearing in the matter. Such contested case hearings shall be conducted in accordance with written policies and procedures adopted by the Health Department and applicable provisions of the Administrative Procedures Act of 1969.

SECTION 11.2 – Contested Case Hearings

Contested case hearings shall be convened and conducted in accord with rules promulgated by the Health Department.

ARTICLE XII – COMPLIANCE AND ENFORCEMENT

SECTION 12.1 – Investigations

If the Health Department believes that a person is violating these Regulations, or a rule promulgated under these Regulations, the Health Department shall make a prompt investigation. If after this investigation the Health Department finds that a violation exists, the Health Department shall attempt to enter into a voluntary agreement with the person.

If a voluntary agreement is not entered into, the Health Department may issue a violation notice or a citation to the owner or violator.

SECTION 12.2 – Enforcement and Compliance

Following the procedures of Section 12.1, which may include a hearing, the Health Officer may record an affidavit that details the non-compliance with the Macomb County Registrar of Deeds. Upon compliance with these Regulations, either through a voluntary agreement, resolution through the appeal process or contested case hearing, or other resolution satisfactory to the Health Department, the Health Officer shall record a release of affidavit with the Macomb County Register of Deeds.

SECTION 12.3 – Assessment Against the Property

If an owner does not have his/her property evaluated as specified by these Regulations; the Health Department shall cause an evaluation to be performed and may charge all costs and fees for the evaluation to the owner of the premises.

SECTION 12.4 – Right to Obtain Samples

An evaluation under Section 5.1 shall include the right to obtain samples where the Health Officer has reason to believe that there is a likelihood of contamination of surface water, ground water, water supply or other unsanitary conditions. Upon written notice, an owner or occupant of premises from which such evaluation is sought shall cooperate with the Health Officer.

ARTICLE XIII – FEES

SECTION 13.1 – General Provisions

Fees for registrations or other services required or authorized by these Regulations shall be assessed according to the current fee schedule established by the Macomb County Board of Commissioners.

ARTICLE XIV – SEVERABILITY

SECTION 14. 1- General Provisions

These Regulations and the various articles, sections and clauses are declared to be severable. If any article, sentence, paragraph, section, or clause is adjudged unconstitutional or invalid, the remainder of these Regulations shall not be affected.

ARTICLE XV – AMENDMENTS

SECTION 15.1 – General Provisions

The Health Officer may adopt amendments and revisions to these Regulations with the consent and approval of the Macomb County Board of Commissioners, pursuant to Sections 2441 and 2442 of the Public Health Code.

ARTICLE XVI – OTHER AGENCY REQUIREMENTS

SECTION 16.1 – Conflicts and Inconsistencies

Where conflicts or inconsistencies exist between the provisions of these Regulations and any regulations, requirements, rules, standards, criteria or guidelines of the federal government or the State of Michigan, the more restrictive requirements shall govern and prevail.

SECTION 16.2 – Local Ordinances

These Regulations shall supersede inconsistent or conflicting local ordinances, pursuant to Section 2441 of the Public Health Code.

SECTION 16.3 – Validity Of Property Transfer

A property transfer subject to these regulations shall not be invalidated solely because of the failure of any person to comply with a provision of these regulations.

ARTICLE XVII – PENALTIES

SECTION 17.1 – Violations

Any person who violates the provisions of these Regulations shall be deemed guilty of a misdemeanor punishable by imprisonment for not more than 90 days, or a fine of not more than \$200.00 or both pursuant to Section 2441(2) of the Public Health Code. Each day that a violation of these Regulations continues shall be deemed a separate offense.

SECTION 17.2 – Civil Penalties

The Macomb County Board of Commissioners may adopt a schedule for monetary civil penalties to be assessed for violations of these Regulations as provided in Sections 2461 and 2462 of the Public Health Code.

SECTION 17.3 – Injunctive Proceedings

When any person has been found to have violated a provision of these Regulations, the Director may maintain injunctive action to restrain, enjoin, prevent or correct a violation of these Regulations, or a condition which adversely affects the public health, as provided in Section 2465 of the Public Health Code.

ARTICLE XVIII – APPROVAL AND EFFECTIVE DATE

SECTION 18.1 – General Provisions

These Regulations have been adopted by the Macomb County Board of Commissioners on August 9, 2001, as amended on December 13, 2001, and shall be effective August 1, 2002. Contracts or purchase agreements executed on or after August 1, 2002 shall be subject to these Regulations.

Appendix H: Glossary and Acronyms

AOC: Great Lakes Area of Concern designated by the International Joint Commission

Aluminum (Al): Aluminum is a natural occurring metal in the environment, but may be present in elevated concentrations resulting from human sources. (Ref 1)

Ammonia (NH₃): Plant nutrient; source of nitrogen which is needed to build protein. Ammonia in aquatic systems is derived from the natural breakdown of nitrogenous organic material, or as a result of industrial discharge. Levels above 0.2 mg/L may indicate pollution. (Ref 1)

Arithmetic Mean: A statistical measure describing the central tendency of a set of data points, calculated by dividing the sum of the data points by the number of data points in the data set.

Benthos: Organisms that live on the lake or river bottom

Bioaccumulation: The increasing concentration of chemical substances through successive levels of the food chain.

Body Contact Recreation: Term used to define state water quality standards for bacterial contamination, to protect the health of people who participate in water recreation activities such as swimming (full-body contact) or fishing and boating (partial-body contact)

BMP: Best Management Practices

Buffer Strips: Protective strips of land surrounding bodies of water which can trap and hold pollutants contained in runoff.

Biochemical Oxygen Demand (BOD): A measure of the amount of organic material in the body of water that is available for decomposition by aerobic (oxygen-consuming) microbiological processes. Values exceeding 4 mg/L may indicate pollution. (Ref 1)

Chemical Oxygen Demand (COD): Chemical oxygen demand is a measure of the organic content and pollution strength of a water sample. COD measures the amount of oxygen required to chemically oxidize the organic material in the sample. This test measures the total oxidizable carbon content, excluding aromatics, pyridines, and some alkyl compounds. (Ref 1)

Chloride: An inorganic ion found in all natural waters, deriving from natural origin or from human uses in agriculture, industry and road de-icing. (Ref 1)

Chlorophyll a: The green photosynthetic pigment found in the cells of algae. Measurement of chlorophyll a in water gives an indication of the trophic state of an aquatic system. In general, increased amounts of chlorophyll indicate higher concentrations of phytoplankton and higher productivity. (Ref 1)

CMOM Standards: Capacity, management, operation, and maintenance standards for SSO management (see SSO)

Combined Sewer Overflow or CSO: Describes a discharge into a body of water, usually the result of a heavy rain or snowmelt that exceeds the capacity of the combined storm and sanitary system. Untreated CSOs are a major source of microorganisms that threaten public health.

Conservation Easement: Land set aside for conservation purposes.

Detention Pond: Ponds created to detain water from running off.

Dissolved Oxygen: A direct measurement of the amount of oxygen in the system available to support aquatic life. Values above 7 mg/L are desirable, levels below 5 mg/L are considered problematic. Levels below 2 mg/L are lethal to many aquatic organisms. (Ref 1)

Escherichia coli (E. coli): A bacterium that is the predominant facultative anaerobe in the digestive tract of humans and warm-blooded animals. Used as an indicator of the presence of human or animal fecal matter in water. (Ref 1)

EPA: The United States Environmental Protection Agency.

Eutrophic: Describes a body of water which has an excess of aquatic growth.

Eutrophication: Naturally, the slow evolutionary process of aging of freshwater lakes leading to an increase in productivity and a decrease in depth. Accelerated lake aging due to man's activities (i.e., cultural eutrophication) decreases artificial increases in productivity due to the addition of nutrients usually phosphorus, and increased sedimentation due to soil erosion.

IDEP: Illicit Discharge Elimination Program

IJC: International Joint Commission

Illicit Connections: Connections of sanitary sewer to the storm sewer system.

Impairment or Impaired Use: The degradation or destruction of a productive use of a water body (e.g., boating, fishing, fish and wildlife habitat or drinking water supply).

Impoundment: A body of water confined by a dam, dike, floodgate, or other barrier.

Limnology: The study of the physical, chemical, meteorological, and biological aspects of fresh water.

Log Jam: A cluster of logs in the river.

Macroinvertebrate: An animal without a backbone large enough to be seen without magnification.

MDEQ: Michigan Department of Environmental Quality

MDNR: Michigan Department of Natural Resources

MDOT: Michigan Department of Transportation

Metals: A wide variety of metals are found in aquatic sediments. Many metals are naturally occurring, but can also be derived from human activity. Low concentrations of many metals are necessary as nutrients for living organisms, however, higher concentrations in the environment may be toxic to aquatic organisms, especially benthic (bottom-dwelling) organisms. Metals are persistent pollutants and can bio-accumulate in some forms. (Ref 1)

Microcystis: Nuisance blue-green algal blooms.

MML: Michigan Municipal League

NAFSMA: National Association of Flood and Storm Water Management Agencies

Nitrate (NO_3^-): Plant nutrient; source of nitrogen which is needed to build protein. The most oxidized form of nitrogen. Derived from the natural breakdown of nitrogenous organic material, agricultural run-off or discharge of sewage. Levels above 0.3 mg/L may stimulate excessive algal growth if phosphorus is not limiting. (Ref 1)

Nitrite (NO_2^-): Usually not present in high concentrations, very quickly oxidized to nitrate under aerobic conditions. (Ref 1)

NOAA: National Oceanic and Atmospheric Administration

Nonpoint Source Pollution: Pollution entering water bodies that is diffused, e.g., surface runoff from agriculture or urbanized areas.

NPDES: National Pollutant Discharge Elimination System.

Nutrient Loadings: The addition of nitrogen or phosphorus to a body of water.

On-Site Disposal System: Usually a septic tank with a drain field.

Ortho-Phosphorus: The simplest form of phosphorus found in aquatic systems. Since algae readily consume it, it is usually found in low concentrations. (Ref 1)

PCB: Polychlorinated biphenyl, a class of persistent toxic organic compounds manufactured for use in a wide variety of industrial and product applications related to its fire retardant and electrolytic properties. Severely restricted in Michigan in 1977 due to environmental contamination problems related to its use.

PEP: Public Education Plan

Phosphorus Limited: The condition where the amount of phosphorus determines the productivity of the lake.

Point Source Pollution: Pollution from concentrated, well defined sources such as wastewater treatment system pipes or storm water pipes.

Probable Effects Concentration (PEC): The concentrations above which harmful effects on benthic organisms are expected to occur frequently. (MDEQ).

RAP: Remedial Action Plan

RDL: Reportable Detection Limit

Riparian: Term used when relating to a river bank.

RPO: Rouge Program Office

RRAC: Rouge River Advisory Council

Sanitary Sewer Overflow or SSO: Describes an unlawful, untreated sewage discharge into a water body from a sewer system designed to transport only sanitary waste.

Sedimentation: The deposition of eroded soil and sand particles in the bottom of water bodies. Alteration of natural landscapes to support residential, commercial, and industrial activity can increase erosion and flows that increase the rate of sedimentation.

SEMCOG: Southeast Michigan Council of Governments

SRF: State Revolving Fund

SWPPI: Stormwater Pollution Prevention Initiative

Threshold Effects Concentration (TEC): The concentrations below which harmful effects on benthic organisms are not expected. (MDEQ)

Total Kjeldahl Nitrogen (TKN): Total Kjeldahl nitrogen is a measure of non-bioavailable nitrogen forms; ammonia and organic nitrogen. These forms may become bioavailable if oxidized by natural processes. Kjeldahl nitrogen may result from municipal and industrial discharges, fertilizer runoff, or natural bio-reduction. (Ref 1)

Total Organic Carbon (TOC): Total Organic Carbon is a measure of the oxidizable carbon available in a water sample. It includes aromatic hydrocarbons, non-biodegradable organic carbon, straight chain aliphatic, and organic nitrogen. As TOC increases, the trophic status of the lake moves toward eutrophication as a respiration increases and dissolved oxygen levels decrease. (Ref 1)

Total Phosphorus: Essential plant nutrient, which is usually in short supply in aquatic systems. Therefore, it often serves as a limiting factor for algal growth. Found in fertilizers and detergents. (Ref 1)

Total Suspended Solids (TSS): A measure of the mass of the total solid material per unit volume in a water sample including dissolved and non-dissolved materials. (Ref 1)

Treatment Plant Bypass: When a sewage treatment plant directs excess sewage that it cannot handle due to high-flow conditions into a nearby river.

Wetland: An area that is regularly saturated by surface water or groundwater and is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions.

**Anchor Bay Watershed
Management Plan**

**Appendix I:
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